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FOOD SAFETY AND QUALITY

Five Countries' Efforts to Meet U.S. Requirements on Imported Produce



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Resources, Community, and
Economic Development Division

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The Honorable Leon E. Panetta
House of Representatives

The Honorable Frank Horton
House of Representatives

This report responds to your September 3, 1987, letter and subsequent discussions with your offices requesting information on (1) foreign government and private industry efforts to assure that imported produce meets U.S. safety and quality standards and (2) what federal agencies are doing to assist foreign countries in meeting U.S. safety requirements. Our review focused primarily on government and private sector pesticide controls over exported produce in five countries: Chile, Costa Rica, the Dominican Republic, Guatemala, and Mexico. We also identified efforts by several federal agencies to help foreign countries improve their pesticide registration and use practices. In addition, we obtained background information on the responsibilities or activities of U.S. agencies, states, and private industry in monitoring imported produce.

As arranged with your offices, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from the date of this letter. At that time, we will send copies to the Director, Office of Management and Budget; the Secretary of Agriculture; the Secretary of Health and Human Services; the Administrator, Agency for International Development; the Administrator, Environmental Protection Agency; the Commissioner, Food and Drug Administration; and other interested parties.

Major contributors to this report are listed in appendix VI.

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Executive Summary

Purpose

With the rapid growth in fruit and vegetable imports during the 1980s, concern about the safety and quality of imported foods and the presence of pesticide residues has increased. Previous GAO work identified weaknesses in monitoring imported food and limited information on foreign pesticide use. As a result, Representatives Leon Panetta and Frank Horton asked GAO to provide information on (1) foreign government and private industry efforts to ensure that imported fresh produce meets U.S. safety and quality standards, (2) what U.S. agencies are doing to assist foreign countries in meeting U.S. safety requirements, and (3) U.S. agencies' responsibilities for safety and quality of imported produce.

Background

The U.S. safety and quality network for imported produce involves several U.S. agencies, states, and private industry. The Environmental Protection Agency (EPA) registers pesticide products and sets maximum acceptable pesticide residue levels—tolerances—allowed in foods consumed in the United States. The Food and Drug Administration (FDA) samples imported foods to identify prohibited substances, including illegal pesticide residues; and it enforces EPA standards for all domestic and imported food products, except meat, poultry, and eggs, which the Department of Agriculture (USDA) monitors. USDA also determines if certain imported produce meets minimum quality requirements for size, grade, and maturity. Some states and supermarket chains have produce tested for pesticide residues. (See ch. 1.)

Latin American and Caribbean countries supply most U.S. imports of fruits and vegetables—5.5 million metric tons, or 77 percent, in 1988. GAO visited five countries—Chile, Costa Rica, the Dominican Republic, Guatemala, and Mexico—which accounted for over half of the Latin America/Caribbean import volume in 1988.

Results in Brief

Like the United States, the five countries' governments have not designed their food safety and quality systems—specifically regarding pesticides—to meet other countries' import requirements but primarily to address domestic needs and issues. Because each country registers pesticides on the basis of its own climate, crops, and pest problems, an exporting country faces a maze of pesticide requirements that may differ from its own and that may not necessarily be health-related. Some of the five governments' pesticide registration practices may affect the legal availability and use of certain pesticides and, therefore, the presence and composition of pesticide residues on produce imports from those countries.

Some countries' export sectors try, to varying degrees, to use management practices that consider U.S. pesticide residue requirements. Where GAO saw evidence of such practices—by multinational firms in all five countries and by other growers in Chile and Mexico—growers had exported produce to the United States for some time and had established networks to obtain information and technical assistance—through cooperative efforts of governments and exporter/grower organizations. Where U.S. requirements were not specifically considered in selecting pesticides for use on exports—particularly among the less experienced growers in Costa Rica, the Dominican Republic, and Guatemala—growers had not developed networks for obtaining information on their export markets' pesticide requirements.

The current Uruguay Round of the General Agreement on Tariffs and Trade has included proposals to harmonize food safety and sanitary requirements—including pesticide residue standards—as a way to reduce their use as technical barriers to trade. However, because adoption of international standards for pesticide residues is a slow, deliberative process, information exchange among nations regarding specific pesticide standards will need to increase to ensure that world trade is facilitated and that consumers are assured that food imports meet their countries' safety standards.

Several U.S. agencies, as well as international organizations, provide assistance related to pesticide use to developing countries. The U.S. agencies include EPA, FDA, USDA, and the Agency for International Development (AID). International organizations include the United Nations' Food and Agriculture Organization, World Health Organization, and Pan American Health Organization. GAO did not review the effectiveness of the agencies' or organizations' assistance.

GAO Analysis

Government Practices That May Affect Residues on U.S. Imports

Government practices that may affect the presence and composition of pesticide residues on U.S. imported produce from the five countries include (1) registering and reregistering pesticides; (2) considering a pesticide's U.S. status during registration; (3) canceling, restricting, or not registering pesticides that EPA has canceled or suspended; (4) providing information about U.S. standards to export growers; and (5) registering pesticides that do not have EPA tolerances. Some practices tend to limit

the legal availability of pesticides that are not allowed in the United States, and they help to increase the likelihood that exports to the United States will not contain residues of such pesticides. For example, the 5 governments had prohibited or not registered from 81 percent to 94 percent of 52 pesticides whose registrations EPA had canceled or suspended as of October 25, 1988, including 26 whose registrations had been voluntarily canceled by manufacturers. In addition, two governments—Chile and Mexico—had provided information on U.S. pesticide residue standards to export growers, to assist them in making pesticide decisions for their crops. (See ch. 2.)

GAO also identified 110 pesticides registered for use in 1 or more of the 5 countries that do not have EPA tolerances established for a food use in the United States. In some cases, EPA may not have evaluated these pesticides or may have denied a U.S. tolerance or registration. Registering pesticides that do not have U.S. registrations or EPA tolerances may be appropriate in a country because of its specific pest problems, crops, and climate; because the pesticides are suitable for nonfood uses; or because exporters need alternative pesticides to be legally available to meet their export markets' differing requirements. While registering such pesticides may be appropriate to a country's needs, using them on exported produce could result in the produce being refused entry to the United States if FDA detects residues. (See ch. 2.)

Export Growers' Pesticide Management Practices

In the five countries, the export sectors have assumed responsibility for ensuring that crops exported to the United States meet U.S. pesticide requirements. Multinational firms and their contract growers in all five countries and experienced export growers in Chile and Mexico had access to U.S. information and technical assistance—through their firms, grower associations, or other resources—and they generally used management practices that considered U.S. pesticide requirements. The Chilean exporters' association has distributed information on U.S. requirements for exported fruit to its members since 1980, and it has provided pesticide control plans for certain fruits. In Mexico, the Confederation of Mexican Fruit and Vegetable Growers Associations, with the Ministry of Agriculture, published a comprehensive wall chart in 1987 showing U.S. pesticide requirements for export crops, and it has distributed pesticide spray schedules to some Mexican export areas.

The less experienced, nonmultinational export growers in Costa Rica, the Dominican Republic, and Guatemala have not had ready access to U.S. information or technical assistance and have not used management

practices that specifically considered U.S. requirements. The United States does not have tolerances established for pesticides used on some of these countries' export crops—in some cases because the crop is not grown commercially in significant quantities in the United States. Grower/exporter groups in these countries were seeking information on U.S. requirements, and U.S. agencies have been expanding assistance to them. (See ch. 3.)

U.S. Agency Assistance

EPA and FDA have provided foreign governments and growers with information and technical assistance on request, and EPA has implemented regional technical assistance workshops. In addition, AID and EPA are providing Latin American and Caribbean export growers with information on what pesticides have U.S. tolerances for specific crops and guidance in developing pesticide monitoring for exports. These efforts should prove useful in (1) decreasing the likelihood that U.S. consumers receive produce grown with pesticides lacking U.S. tolerances, (2) helping these countries avoid violations, and (3) preventing economic losses to exporters and U.S. importers. (See ch. 4.)

Issues for Congressional Consideration

The extent to which, and in what ways, U.S. agencies should increase their involvement in establishing tolerances for imported crops and in increasing the flow of information on U.S. food safety and quality standards are issues that will confront the Congress as it deliberates on both food safety and U.S. competitiveness. These issues also have implications regarding U.S. agencies' responsibilities and resources. Such actions could help developing countries provide U.S. consumers with increased assurance about the safety and quality of imported foods and increase the countries' exports to the United States. However, these actions could also help foreign growers and exporters compete more directly with U.S. producers and processors and increase U.S. agencies' resource needs. (See ch. 5.)

Agency Comments

GAO discussed the information contained in a draft of this report with responsible EPA, FDA, USDA, and AID officials. Their comments have been incorporated in the report where appropriate. As requested, GAO did not obtain official agency comments on the report.

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Abbreviations

AID	Agency for International Development
AMS	Agricultural Marketing Service
APHIS	Animal and Plant Health Inspection Service
CAAP	Private Industrial and Agriculture Council of Costa Rica
CBI	Caribbean Basin Initiative
CICP	Consortium for International Crop Protection
EPA	Environmental Protection Agency
FAO	Food and Agriculture Organization
FDA	Food and Drug Administration
FFDCA	Federal Food, Drug, and Cosmetic Act
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
GAO	General Accounting Office
GREMIAL	Export Federation Guild of Guatemala
IICA	Inter-American Institute for Cooperation on Agriculture
IR-4	Inter-Regional Research Project Number 4
JACC/DR	Joint Agribusiness Coinvestment Council, Inc., of the Dominican Republic
NTAE	Nontraditional Agricultural Exports
OICD	Office of International Cooperation and Development
OTA	Office of Technology Assessment
PAHO	Pan American Health Organization
ROCAP	Regional Office for Central America/Panama
UNEP	United Nations Environmental Program
UNPH	Confederation of Mexican Fruit and Vegetable Growers Associations
USDA	U.S. Department of Agriculture
WHO	World Health Organization

Introduction

A rapid increase in fruit and vegetable imports during the 1980s has been accompanied by government and public concern about the safety and quality of such imports, particularly about the presence of pesticide residues. Specifically, questions have been raised about whether residues on imported produce exceed U.S. tolerances and if pesticides banned in the United States are being used on foods exported to the United States.¹

Pesticides are chemicals or biological substances used to destroy or control weeds, insects, fungi, rodents, and bacteria. Pesticides are a mixed blessing: they enhance agricultural productivity and improve public health through control of disease-carrying pests, but they can adversely affect people, nontarget organisms such as fish and wildlife, and the environment.

Worldwide pesticide sales have dramatically increased: from 1977 to 1987, the worldwide agricultural chemical market doubled in size to more than a \$17 billion industry. Developed countries, such as Japan and the United States, have been using increasing amounts of pesticides, and developing countries have been importing progressively more pesticides. According to a 1986 United Nations Food and Agriculture Organization (FAO) publication,² Latin American countries³—major fruit and vegetable producing countries that export to the United States—were fourth in pesticide amounts used per hectare,⁴ after Japan, Europe, and the United States. (See app. I.) The Environmental Protection Agency (EPA) estimates that about half, and sometimes less than half, of most Latin American countries' pesticide imports come from the United States.

While international guidelines on the registration and use of pesticides on food exist, their adoption by individual countries is voluntary. Each country sets its own laws for pesticide registration and use, which vary considerably in sophistication and degree of implementation among

¹ A pesticide residue tolerance is the maximum legal level of a pesticide residue that may exist in or on a food. According to Environmental Protection Agency officials, EPA generally sets tolerances so that total dietary intake from all crops is at least 100 times lower than the lowest nontoxic level observed in laboratory exposure tests of animals and so that residues will be unlikely to result in human health/toxicity problems.

² Bengt V. Hofsten and George Ekstrom, editors, *Control of Pesticide Applications and Residues in Food: A Guide and Directory—1986* (Uppsala, Sweden: Swedish Science Press).

³ In this report, Latin America refers to the countries of Central and South America.

⁴ 1 hectare = 2.47 acres.

countries. The United States can exercise control over pesticide use in other countries only insofar as it identifies residues on food as it enters the United States.

Rising Fruit and Vegetable Imports

In May 1988 we reported that U.S. agricultural imports had generally increased from 1980 through 1986 and that fruit and vegetable imports had risen more quickly than total agricultural imports.⁵ Specifically, the report stated that, from 1980 to 1986, U.S. fruit imports tripled and vegetable imports more than doubled in real value. In addition, the import share of the U.S. market for major fresh and frozen fruits rose from about 26 percent to about 33 percent; the share for major fresh vegetables rose from about 5 percent to about 7 percent.

Most U.S. fruit and vegetable imports come from Latin America and the Caribbean—5.5 million metric tons, or 77 percent of the total U.S. imports of fruits and vegetables in 1988. (See app. II.) Together, Chile, Costa Rica, the Dominican Republic, Guatemala, and Mexico—the five countries on which this report focuses—accounted for 59 percent of the U.S. import volume from Latin American and Caribbean countries in 1988. Mexico was the principal supplier with 32 percent of these Latin American/Caribbean imports. Other Latin American countries that supplied fruits and vegetables to the United States during 1988 included Colombia, Ecuador, Honduras, and Panama.

Many countries in the Latin American/Caribbean region have emphasized diversification of their agricultural exports in recent years as world prices and demand for many of their traditional export commodities, such as sugar and coffee, have leveled off or declined. Several of these countries are trying to identify new specialty crops, such as asparagus and melons, to fill market niches. The Agency for International Development (AID) is assisting some of these nations in increasing their exports of nontraditional fruits and vegetables, mostly to the United States.⁶ (See ch. 4.)

⁵Agricultural Trade: Causes and Impacts of Increased Fruit and Vegetable Imports (GAO/RCED-88-149BR, May 10, 1988).

⁶According to an AID official, nontraditional fruits and vegetables are commodities other than traditional plantation crops—coffee, cotton, cacao, and beef—that are produced in very large volume. Nontraditional crops have been produced in the Latin American/Caribbean region for less than 15 to 20 years, generally in response to increased U.S. demand for winter produce.

Concerns About Residues on Imported Produce

Concerns about the safety and quality of imported produce, which focus mainly on pesticide residues, have been raised by government agencies, environmental groups, and others. In addition, international organizations and environmental groups have recognized the general need for improved food safety systems in developing countries, many of which export fruits and vegetables to the United States and other countries.

In September 1986 we reported that the Department of Health and Human Service's Food and Drug Administration's (FDA) import monitoring program provided limited protection against public exposure to illegal residues in imported food.⁷ We said that FDA sampled less than 1 percent of the approximately 1 million imported food shipments each year.⁸ In addition, we raised concerns about FDA's limited information about what pesticides foreign countries use. In response to our recommendations, FDA has made changes in its sampling program and taken steps to increase its information on foreign pesticide use. In addition, the Pesticide Monitoring Improvements Act of 1988 (Subtitle G of Title IV of the Omnibus Trade and Competitiveness Act of 1988, P.L. 100-418) required the Secretary of Health and Human Services to improve FDA's data collection and management of information related to pesticide residues in imported and domestically produced foods, including obtaining information on pesticides used on exported foods destined for U.S. markets.

In 1988 the Office of Technology Assessment (OTA) reported that limitations in FDA's analytical methods create problems in enforcing pesticide tolerances on imports because FDA does not test for some pesticides used in foreign countries that are not approved for use in the United States.⁹ OTA added that the testing limitations are compounded by FDA's lack of information on what pesticides have been used on specific crops, especially imports.

Environmental groups have also raised questions concerning U.S. knowledge about use of pesticides on U.S. imports. For example, the Natural Resources Defense Council, a national, nonprofit environmental organization, testified before the Subcommittee on Health and Environment, House Committee on Energy and Commerce, in December 1987 on the

⁷Pesticides: Better Sampling and Enforcement Needed on Imported Food (GAO/RCED-86-219, Sept. 26, 1986).

⁸A July 1989 staff report by the Subcommittee on Oversight and Investigations of the House Committee on Energy and Commerce indicated a sampling rate of about 2 percent for fiscal year 1987.

⁹Pesticide Residues in Food: Technologies for Detection, OTA, Oct. 1988.

need for more information on foreign pesticide use. The Council stated that foreign growers may legally purchase and use pesticides whose residues may be illegal if that product is imported into the United States.

Broader food safety concerns about imports from Latin America and the Caribbean were discussed at the August 1985 Inter-American Conference on Food Protection, which was convened by the National Academy of Sciences. The conference, which was attended by representatives of North American and most Latin American and Caribbean countries, related to issues concerning the safety of foods both consumed within countries and shipped among countries. The conference report identified several factors that might negatively affect food safety in developing Latin American and Caribbean countries.¹⁰ These factors included economic problems; inadequate government control over food safety; and lack of technical knowledge, advisory services, financial resources, and physical facilities for proper quality assurance. The report concluded that a lack of timely and effective technical and commercial information particularly hinders developing countries' regulatory officials and private industry in making appropriate choices in food safety and quality decisions.

U.S. Safety and Quality Network for Imported Produce

The U.S. safety and quality network for imported produce involves several federal agencies, as well as states and private industry. At the federal level, EPA registers pesticides and establishes pesticide residue tolerances that all fresh produce and other foods and feeds—whether domestic or imported—must meet to be legally allowed for U.S. consumption. EPA can also establish tolerances—sometimes called import tolerances—for pesticides where there is no registration request and the commodity is being treated outside the United States. It can also grant tolerance exemptions when it determines a tolerance is not necessary to protect the public health.

EPA is required to notify foreign countries about (1) U.S. exports of unregistered chemicals to their countries and (2) EPA actions to cancel or suspend a pesticide's U.S. registration. Pesticides used in foreign countries are not required to be registered with EPA. However, foreign uses of pesticides that do not have an EPA tolerance or an exemption can result in a commodity's rejection at U.S. entry points if residues are detected.

¹⁰Food Protection in the Americas (Washington D.C.: National Academy Press, 1987).

FDA, which is responsible for protecting the U.S. public from unsafe foods and other products, enforces the EPA pesticide residue tolerances for all food products—both domestic and imported—except meat, poultry, and eggs, which are monitored for pesticide residues by U.S. Department of Agriculture (USDA) agencies. FDA is also responsible for identifying imported foods that contain chemical contaminants, have microbial and filth contamination, foreign objects, or that are decomposing. A food shipment is considered adulterated if, among other things, it contains either (1) a pesticide residue that is not subject to an EPA-approved tolerance for that food or (2) a pesticide residue in an amount greater than the EPA tolerance level.

The U.S. Customs Service can deny admission of any food presented for import if the food is adulterated, and it can assess and collect damages if adulterated shipments are not reexported or destroyed. In some cases, previously adulterated food is allowed admission if other action brings it into compliance with U.S. requirements.

USDA is authorized to inspect imported produce to determine its quality. USDA's Agricultural Marketing Service (AMS) administers a mandatory inspection program for quality standards of size, maturity, and grade for certain imported commodities covered by domestic marketing orders.¹¹ As of March 1988 these commodities were avocados, dates (except dates for processing), filberts, grapefruit, table grapes, limes, olives (except Spanish-style olives), onions, oranges, Irish potatoes, prunes, raisins, tomatoes, and walnuts.¹² AMS also administers a voluntary inspection program for fresh produce that financially interested parties can use. USDA's Animal and Plant Health Inspection Service (APHIS) inspects produce, animals, and other products at U.S. entry points (and conducts inspection, survey, and control activities at some foreign locations) to prevent the introduction of foreign pests and diseases that can harm U.S. agriculture.

The federal agencies' activities are discussed in more detail in appendix III.

¹¹Marketing orders are marketing plans designed by growers and handlers, and approved by the Secretary of Agriculture, to collectively work out solutions to marketing problems. Marketing orders are issued as federal regulations. Under section 8e of the Agricultural Marketing Agreement Act of 1937, as amended (7 U.S.C. 608e-1), the marketing orders govern the quality of certain imported commodities during the domestic marketing season.

¹²Legislation before the 101st Congress (H.R. 2026, H.R. 3567, and S. 1729) would add such commodities as kiwi fruit, nectarines, papayas, and plums to the list of imported commodities subject to mandatory inspection.

Although federal agencies are responsible for ensuring the safety and quality of the U.S. food supply, some states may set regulations more stringent than the federal regulations. In addition, some states have established their own pesticide residue testing programs. In the states we contacted—California, Florida, and New York—testing primarily focuses on domestic produce, although imports are also sometimes tested. According to officials in these states, they use EPA tolerances as guidance and rely primarily on federal enforcement activities to monitor pesticide residues on imported fruits and vegetables.

Some supermarket chains and other importers contract for their produce prior to receipt and may indicate general quality specifications for the imported produce in the contract. However, officials of many of the major supermarket chains and other importers with whom we spoke said that they purchase their imported fresh produce on consignment at U.S. entry points. According to these importers, regardless of whether produce is purchased on consignment or under contract, they tend to rely on FDA to determine whether imported fresh produce meets U.S. pesticide tolerances. Some supermarket chains, however, have begun using private testing services to monitor produce for pesticide residues.

International Organizations' Roles in Developing Food Safety Systems

Several international organizations play important roles in assisting developing countries to develop their food safety control systems. These organizations include the U.N. Food and Agriculture Organization; the U.N. World Health Organization (WHO); the Codex Alimentarius Commission, a subsidiary body of FAO and WHO; the Pan American Health Organization (PAHO); and the Inter-American Institute for Cooperation on Agriculture (IICA). These organizations, whose activities are discussed in more detail in appendix IV, create model food laws, recommend food control regulatory policies, set international standards and guidelines for foods, mobilize resources, and provide technical assistance to individual countries upon request.

Objectives, Scope, and Methodology

In a September 3, 1987, letter and subsequent discussions with their offices, Representative Leon Panetta, then Chairman, Subcommittee on Domestic Marketing, Consumer Relations, and Nutrition, House Committee on Agriculture, and Representative Frank Horton asked us to (1) obtain information on foreign government and private sector efforts to ensure that imported produce meets U.S. safety and quality standards and (2) determine what federal agencies are doing to assist foreign countries in meeting U.S. safety requirements. In addition, they asked us to

discuss federal agencies' responsibilities regarding the safety and quality of imported produce. As agreed, we focused most of our effort on safety standards related to pesticide controls.

To respond to the first objective, we visited five countries in Latin America and the Caribbean between March and October 1988: Chile, Costa Rica, the Dominican Republic, Guatemala, and Mexico. We selected these countries for several reasons:

- Latin American and Caribbean countries supply most U.S. imports of fruits and vegetables—77 percent in 1988.
- The five countries together contributed over half of the Latin American/Caribbean volume in 1988.
- Mexico provides most of the fresh vegetables, such as tomatoes, cucumbers, peppers, eggplant, squash, and asparagus, imported into the United States.
- Mexico and Chile accounted for most of the increased U.S. imports of fresh tomatoes, broccoli, and table grapes between 1980 and 1986.

In addition, we considered information, obtained from various sources during preliminary discussions, on the countries' length of experience with fruit and vegetable exports and their varying levels of sophistication in government regulatory programs. Most of the U.S. produce imports from Costa Rica and Guatemala are bananas—about 90 percent and 80 percent, respectively, in 1988. U.S. imports from Mexico and the Dominican Republic are mostly vegetables and other fruits, and imports from Chile are mostly fruit.

In the five countries, we met with government officials responsible for pesticide standards and food safety monitoring; officials of the Costa Rican and Mexican national pesticide commissions; representatives of regional and international organizations, such as FAO, PAHO, and IICA; environmentalists and university experts; representatives of grower and exporter associations; exporters; export growers; representatives of Chile's Chemical Producers Association; and U.S. embassy officials. We also met with FAO, PAHO, and IICA representatives in Washington, D.C. We did not verify all the information obtained from these sources or evaluate the adequacy of food safety and quality activities in the five countries.

For information about the controls these countries' governments use to help ensure that exported produce destined for the United States meets U.S. pesticide tolerances, we interviewed foreign government officials

responsible for pesticide registration and use and reviewed applicable laws and regulations; official government lists of registered chemicals; and proclamations, statutes, or other documents relating to the use of pesticides. We also obtained available studies and analyses related to the use of agricultural chemicals in each country and spoke with laboratory personnel in Costa Rica and Guatemala.

To determine if pesticides were legally available for use in the five countries that do not have tolerances established for a food use in the United States, we compared the official government lists of registered pesticides for each of the five countries with lists of active U.S. pesticide tolerances in the U.S. Code of Federal Regulations (40 C.F.R. part 180 and 40 C.F.R. part 185, which was formerly 21 C.F.R. part 193) and information in commercial publications.¹³ To determine if these countries had pesticides registered for use, and therefore legally available, that the United States had canceled or suspended, we compared the countries' lists of official pesticide registrations with EPA's Office of Pesticide Programs' October 25, 1988, revised lists of (1) canceled/suspended pesticides and (2) voluntarily canceled chemicals of significance. These lists include pesticides that EPA has identified as having the majority of food uses withdrawn or canceled but do not include all restricted pesticides. We did not verify EPA's definition of the status of these pesticides.

For information on the 5 countries' private sector efforts to meet U.S. pesticide and quality standards for imported produce, we interviewed officials of 5 exporter and grower associations; 18 export growers; 9 exporters; and 22 grower/exporters, of which 5 were multinational firms. We asked about their management practices for determining and using pesticides and for ensuring quality and reviewed the exporter and export growers' pesticide use planning documents, such as spray plans, and pesticide purchase and application records, where available.

The exporters and growers we interviewed produced a variety of fruits and vegetables for export to the United States, including pineapples, strawberries, chayote, and yucca in Costa Rica; bananas, broccoli, sugar peas, and strawberries in Guatemala; tomatoes, strawberries, and

¹³The lists for Chile, the Dominican Republic, and Guatemala were 1987 lists. Costa Rica's official list was current as of our visit in June 1988, according to Ministry of Agriculture officials. For Mexico, we examined two pesticide lists, one from the Ministry of Agriculture for 1987 and one developed by Mexico's Interministerial Pesticide Commission in 1988, which commission officials told us would supersede all previous lists of official pesticide registrations. In addition, we examined the Ministry of Agriculture's estimate of pesticide consumption for 1988.

watermelon in Mexico; Chinese vegetables, melons, and tomatoes in the Dominican Republic; and grapes and tree fruit in Chile.

We obtained information on Chilean export growers' pesticide management practices primarily from representatives of Chile's exporters' association and from 4 exporters, 16 export growers, and 1 multinational grower/exporter selected from the association's list of exporters. We collected information on Mexican export growers' pesticide management practices primarily from representatives of Mexico's Confederation of Mexican Fruit and Vegetable Growers Associations (UNPH) and from 12 grower/exporters in 4 of Mexico's 5 largest exporting states (Sinaloa, Sonora, Baja California, Michoacan, and Tamaulipas). These 5 states produced 84 percent of Mexico's exports to the United States during the 1987-88 growing season. UNPH selected the Mexican exporters and growers according to our specification of location and crops grown.

In Costa Rica, the Dominican Republic, and Guatemala, we obtained information on export growers' pesticide management practices from exporter and grower associations; five exporters; two individual export growers; nine grower/exporters, of which four were multinational firms; and, in the Dominican Republic, several export growers in a group. The associations are the Private Industrial and Agriculture Council of Costa Rica (CAAP); the Joint Agribusiness Coinvestment Council, Inc., of the Dominican Republic (JACC/DR); and the Export Federation Guild of Guatemala (GREMIAL). We selected exporters and growers in these countries with assistance from USDA's Foreign Agricultural Service agricultural attaches, APHIS officials, and AID officers in the U.S. embassies in these countries.

We analyzed 1986 FDA import violation data to determine the extent and reasons for pesticide violations on imported produce. We also determined the proportion of imported fresh produce that was required to meet minimum quality standards from 1985 through 1987 for each country. We did not determine what proportion of total fresh produce imported from these countries, and inspected by AMS, was rejected, however, because the data were not computerized, and inspection certificates with the rejection data were grouped by port and importer, rather than by country.

To determine what federal agencies were doing to assist foreign countries in meeting U.S. safety requirements, we interviewed officials from EPA, FDA, and AID headquarters; the AID regional office for Central America and Panama; and AID bilateral missions in Costa Rica, the

Dominican Republic, and Guatemala. We also reviewed EPA and FDA international program documents, such as workshop records, foreign visitor and training records, and special project documents. We did not verify these activities or evaluate their effectiveness.

To obtain information on federal agencies' responsibilities regarding the safety and quality of imported produce, we reviewed prior GAO reports and agency documents and spoke with officials from EPA, FDA, AMS, and APHIS. APHIS is not directly involved in ensuring the safety or quality of imported fruits and vegetables, but it conducts inspection and quarantine activities at U.S. entry points (and inspection, survey, and control activities at some foreign locations) to identify and prevent the introduction of exotic animal and plant diseases and pests that might threaten U.S. agriculture. We did not verify these agencies' program activities or evaluate their effectiveness.

For information on what some states and private industry were doing to monitor pesticide use on imported produce, we spoke with state department of agriculture officials and reviewed annual reports and other related documents from three states—California, Florida, and New York—and spoke with various importers and supermarket chain representatives.

For additional background information, we visited FDA offices in Philadelphia and Los Angeles and spoke with representatives of the National Food Processors' Association and NutriClean, a private residue-testing service.

We did our work primarily between February and December 1988, with updates as appropriate through February 1990, in Philadelphia, Pennsylvania; Washington, D.C.; California; Chile; Costa Rica; the Dominican Republic; Guatemala; and Mexico. We discussed the information contained in a draft of this report with responsible EPA, FDA, USDA, and AID officials. Their comments have been incorporated in the report where appropriate. However, as requested, we did not obtain official agency comments on this report.

Foreign Governments' Efforts to Meet U.S. Safety and Quality Requirements on Exported Produce

Like the United States, the governments in the five countries we visited (Chile, Costa Rica, the Dominican Republic, Guatemala, and Mexico) do not design their food safety and quality systems—specifically their pesticide registration and monitoring systems—to meet other countries' safety and quality standards, but primarily to address domestic needs and issues. Each of the five countries has laws and regulations controlling pesticide availability and use; however, government monitoring and enforcement activities are generally limited because of a lack of resources.

Each country's need for legally registered pesticides is unique, depending on the climate, crops grown, pest problems, and nonfood-use requirements. A country's export markets may have different pesticides registered for use on a given crop or they may have the same pesticide registered, but for different crops. As a result, an exporting country needs to have a range of pesticides available so that export growers can meet many export markets' pesticide requirements. In addition, an exporting country needs to have information on its export markets' pesticide requirements and quality standards to ensure successful exportation of its produce.

Although the five countries' regulatory systems are not specifically aimed at meeting U.S. import standards, most of the government officials told us that they may cancel, restrict, or not register pesticides that are canceled, restricted, or suspended in the United States, if the information is known. When pesticides that have been canceled or suspended in the United States are prohibited or not registered for use in these countries, it helps decrease the legal availability of such pesticides for use on exported produce. In addition, two of the governments provide information to export growers about U.S. pesticide requirements for specific export crops. Because of the variety of pesticides that different countries may allow for use on a given crop, providing information to export growers on U.S. requirements increases the likelihood that the growers will be able to meet U.S. requirements for their exported produce.

Conversely, the five governments have registered some pesticides that do not have tolerances established in the United States. The legal availability of these pesticides may increase the possibility of their being used on produce exported to the United States. While the reasons these pesticides do not have U.S. tolerances may be other than health-related, imported produce with residues of these pesticides would be considered violative if FDA detects them.

On the matter of quality, government officials in the five countries told us that their governments do not monitor fruits and vegetables to determine whether produce destined for export meets the size, maturity, grade, or other quality standards of their growers' export markets. As with pesticides, exporters are expected to know and meet their export markets' quality requirements.

Government Practices That May Affect Residues on U.S. Produce Imports

Officials of the five governments we visited told us about a number of practices that affect the legal availability and use of pesticides in their countries, and therefore the presence and composition of pesticide residues on U.S. produce imports from those countries. These practices included (1) registering and reregistering pesticides; (2) considering the U.S. status of pesticides before making registration decisions; (3) having canceled, restricted, or not registered pesticides that do not have U.S. registrations or tolerances; (4) providing information about U.S. pesticide requirements for export crops to growers; and (5) registering pesticides that do not have EPA tolerances.

Registration Practices

Registration procedures are necessary to provide for the proper and safe use of pesticides and to protect people and the environment from ineffective or detrimental chemicals. Each country we visited had established a pesticide registration system that requires pesticides to be registered before they can be sold or used. With the exception of the Dominican Republic, each country required pesticide registrations to specify crop use.¹

The five countries' registration processes require registrants (usually chemical manufacturers) to provide much of the same type of information EPA requires for a U.S. registration: the pesticide's name, chemical composition, and use instructions; health and environmental safety studies; and residue information. All five countries use the international maximum residue limits (tolerances) developed by Codex. In the United States, EPA's Office of Compliance Monitoring, in conjunction with FDA, conducts randomly selected inspection audits—usually post-registration—of the laboratory practices used in conducting the scientific studies that support the registration data, according to a former Director of the Registration Division of EPA's Office of Pesticide Programs. However,

¹The Dominican Republic revised its pesticide statute in 1988 to include, among other things, a requirement for a pesticide registration to be crop-specific. At the time of our visit, however, the statute had not received final approval. Ministry of Agriculture officials told us that they expected it would be signed by December 1988.

officials of four of the five countries told us that their governments do not validate the scientific studies presented by the registrants, generally because of a lack of scientific and budgetary resources. Mexican government officials told us that they validate the scientific studies to a limited extent.

While the five countries do not generally register pesticides to meet another country's import requirements, we found that the governments have prohibited or not registered many pesticides that the United States has canceled or suspended, usually because of health or environmental concerns. Canceling registration of, restricting use of, or not registering pesticides that are canceled or suspended in the United States help to ensure that these pesticides will not be legally available for use on export crops.

Considering U.S. Status of Pesticides Before Making Registration Decisions

Foreign government officials told us that, during the registration process, they try to determine the pesticide's status in industrialized countries, including the United States. To do so, they depend primarily on the registrant's providing a certificate of free sale for the country of origin—that is, the registrant's certification that the pesticide is legal for use in the country where it is manufactured. The officials' use of other sources of U.S. pesticide information provided by EPA and Codex varied among the five countries, depending on the officials' degree of access to this information.

Each of the five countries required registrants to submit a certificate of free sale from the country of origin. The amount of information required to be submitted with the certificates, however, varied among the countries. For example, the Dominican Republic requires documentation from a "competent authority" that indicates the pesticide's name and formula, registration number, and date of registration, and an indication of whether the chemical is unrestricted, prohibited, or manufactured for export because it has no commercial use in the country of origin.

Similarly, Costa Rica requires "official documentation showing the registration number, date of registration or renewal, type of formula and concentration." In addition, when a pesticide is not registered in the country of origin, Costa Rica requires documents from the manufacturer or "appropriate authorities" indicating the reason. While documentation issued by a corresponding government agency or competent authority is required, verification by the corresponding government agency in the

country of origin was not required in these countries. Mexico's documents indicated that it would accept certification from a third country.

According to some government officials, the free sale certificate assures these governments, to some degree, that because the pesticide has been registered in an industrialized country, the health effects probably have been independently validated. Because the countries we visited generally lack the resources to independently validate the studies described in the chemical companies' application data, government officials depend on these certificates to protect their countries from registration and indiscriminate sale of untested chemicals or chemicals that have been proven unsafe. We did not verify the countries' use of these practices.

Officials of the five countries said that they consider other U.S. sources of information, such as notices under sections 17(a)² and 17(b)³ of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) (7 U.S.C. 136o(a) and (b)), if available, when making pesticide registration decisions. These notices can be valuable to foreign countries in properly evaluating the risk of registering or continuing use of a pesticide. Chilean officials also said that they have their embassy staff in the United States routinely obtain needed information directly from EPA on the U.S. status of pesticides. Similarly, Costa Rican officials responsible for agricultural pesticide registrations told us that, during the process of making registration decisions on a certain group of pesticides, they had requested and received some additional information from EPA.

Although government officials in each country except Chile and Mexico (who said they already received enough information) expressed interest in consistently obtaining information on U.S. pesticide standards and changes in pesticide status, this information is not always readily available. In an April 1989 report,⁴ we said that EPA had not issued notices to foreign governments for all pesticides where significant action had been

²Section 17(a) establishes notification requirements for the export of pesticides that are not registered for domestic use in the United States. In a series of steps, the foreign purchaser must acknowledge, and the government is subsequently notified, that the pesticide is not registered and cannot be sold for use in the United States.

³Section 17(b) requires EPA to notify foreign governments and appropriate international agencies about significant changes in a pesticide's U.S. status, such as cancellation or suspension. The notices generally contain information on when EPA took the action, background on what precipitated the action, an explanation of the action, and the basis EPA had for taking the action. The notices also identify EPA contacts from which foreign governments can request additional information on the affected pesticide and registered products that could be used in lieu of the pesticide.

⁴Pesticides: Export of Unregistered Pesticides Is Not Adequately Monitored by EPA (GAO/RCED-89-128, Apr. 25, 1989).

taken and that EPA's 1985 booklet entitled Suspended, Cancelled, and Restricted Pesticides was outdated. We said that the type of information in this booklet, if updated and disseminated, would be sufficient to alert countries using the included pesticides to initiate actions or request additional data as a basis for making their own risk/benefit analysis concerning use. The booklet also serves as a reference document on past U.S. actions.

We recommended that EPA (1) develop criteria and procedures for determining whether and when to prepare and issue notices of regulatory action (sec. 17(b) notices); (2) annually update and issue to all concerned parties, including foreign governments, its booklet entitled Suspended, Cancelled, and Restricted Pesticides; and (3) establish guidance on 17(a) transmittal procedures for sending notices to foreign governments and coordinate with the Department of State in updating and sending 17(a) and 17(b) notices to U.S. embassies. We believe that these improvements would enhance foreign governments' efforts to use established information on pesticides from other countries in making their pesticide use decisions.

On February 12, 1990, EPA published a Federal Register notice on proposed changes to its notification process. The notice cited our report's recommendations and issues discussed during May 1989 hearings on pesticide exports before the House Subcommittee on Environment, Energy, and Natural Resources, as reasons for the proposed changes.

Reregistration Practices

Each of the five governments' regulations provided for (1) reregistration procedures or reviews and/or (2) procedures for revoking a pesticide's registration when adverse health, safety, or environmental factors become known. These countries—like the United States—do not always remove canceled pesticides from registration lists and commerce at the time of cancellation. As a result, pesticides that are officially not approved for use in a country may sometimes be legally found in distribution channels.

According to the former Director of the Registration Division of EPA's Office of Pesticide Programs, EPA determines how long a pesticide can remain in commerce and use in the United States on a case-by-case basis as a result of a risk/benefit determination made during the review process to determine whether a pesticide should be canceled. In most cases, if no immediate health risk exists or if cancellation is due to financial decisions, EPA may allow a pesticide to stay in distribution channels for a

specified time. However, if a pesticide's registration is suspended on an emergency basis, EPA prohibits sale or use of the pesticide concurrently with the suspension.

The countries we visited handled the availability of recently prohibited pesticides in various ways. For example, some countries' regulations, such as the Dominican Republic's and Costa Rica's, specify that if a chemical is voluntarily canceled by a manufacturer, the registration will be maintained for 2 years until existing stocks are used. In Mexico, when officials determine that a pesticide should be removed from the official pesticide list, it is still legal for use for 2 years. In Guatemala and the Dominican Republic, pesticides that have had their registrations canceled are allowed to remain in commercial channels for a time to allow existing supplies to be depleted.

In Guatemala, for example, 18 pesticides were canceled in 1987. As of May 1988 its list of registrations continued to include several of these chemicals because, according to government officials, they gave the chemical companies 6 months to sell existing stocks, and use of these pesticides was to be allowed to continue until supplies were exhausted. Similarly, the Dominican Republic canceled a series of pesticides during the 1970s; some, however, had not been removed from the government's list of registered products as of October 1988. For example, distribution and sale of the pesticide 2,4,5-T is prohibited; yet the chemical's registration was still listed in 1988.

Canceling or Restricting Pesticides That Are Illegal in the United States

In the countries we visited, a number of pesticides that EPA has canceled or suspended in the United States, or that chemical manufacturers have voluntarily canceled, have also been prohibited from importation, sale, and use; have had their uses restricted; or are not registered. As a result, the legal availability of such pesticides is limited, decreasing the likelihood that they will be used on exported produce.

Table 2.1 shows the 1988 registration status in the five countries of 26 pesticides whose U.S. registrations EPA had canceled and/or suspended, for various reasons, as of October 25, 1988. As the table shows, the five governments have prohibited, restricted, or not registered many of these pesticides.

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Table 2.1: Status in Five Countries of Pesticides on EPA's October 25, 1988, Revised List of Canceled and/or Suspended Chemicals

Pesticide	Chile	Costa Rica	Dominican Republic	Guatemala	Mexico
Aldrin ^a	P/L	P	P	P	NR
Aspon	NR	NR	NR	NR	NR
Brominated salicylanilide	NR	NR	NR	NR	NR
Carbophenothion ^b	NR	NR	R	NR	R
Chlordane ^a / Heptachlor ^c	P	R	RS ^d	P/L	R
Cycloheximide ^b	NR	NR	NR	NR	NR
DBCP (dibromochloropropane)	NR	P	P/L	P/L	NR
DDD (TDE) (1,1-dichloro-2,2 bis [p-chlorophenyl] ethane)	NR	NR	NR	NR	NR
DDT (dichloro diphenyl trichloroethane)	P	P	NR	P	R ^e
Demeton ^b	NR	NR	NR	NR	NR
Dialifor ^b	NR	NR	NR	NR	NR
Dieldrin ^a	P/L	P	P/L	P	NR
Dinitramine ^b	NR	NR	NR	NR	NR
Dinoseb ^b	NR	P	NR	P/L	NR
EDB ^b (ethylene dibromide)	P	P	P	P	R
Fenaminosulf	R	R	NR	R	NR
Fluchloralin ^b	NR	NR	R	NR	NR
Kepone (Chlordecone)	NR	P	RS	NR	NR
Mirex	NR	NR	NR	R	NR
Monuron TCA (trichloroacetic acid)	NR	NR	NR	NR	NR
Perfluidone ^b	NR	NR	NR	NR	NR
Potassium permanganate	NR	NR	NR	NR	NR
Silvex ^b	NR	P	NR	NR	NR
2,4,5-T (2,4,5-trichlorophenoxy-acetic acid)	NR	P	P/L	P/L	NR
Thiophanate	NR	NR	NR	NR	NR
Toxaphene ^b	NR	P	NR	P/L	R

Legend

NR = Not registered for use

P = Prohibited or suspended

P/L = Prohibited; not removed from country's list of registered pesticides

R = Registered for use

RS = Restricted

^aEPA has action levels (see table 2.4, note a) for this pesticide.

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^bEPA has a tolerance(s) for this pesticide.

^cEPA has tolerances and action levels for this pesticide.

^dThe Dominican Republic permits use only for termites.

^eMexico's health ministry uses DDT to control malaria.

Source: EPA's Office of Pesticide Programs' Oct. 25, 1988, revised list of canceled and/or suspended chemicals; official pesticide registration documents, statutes, resolutions, and proclamations from five countries; 40 C.F.R. parts 180 and 185 (revised as of July 1, 1989); and The Pesticide Chemical News Guide (Washington, D.C.: Louis Rothschild, Jr.), June 1, 1988..

Of the 26 pesticides on EPA's list, 17, or 65 percent, were either prohibited or not registered in all 5 countries. Chile had not registered or had prohibited use of 25 of the 26 pesticides, or 96 percent; Costa Rica and Guatemala, 24, or 92 percent; the Dominican Republic, 22, or 85 percent; and Mexico, 21, or 81 percent.

Among the 5 countries, Mexico had the most pesticides registered of the 26 that had been canceled or suspended in the United States. However, one of the pesticides, heptachlor, which was previously registered for use in the Ministry of Agriculture's catalog of approved chemical uses, is not listed as registered in the new Official Catalog of Registered Chemicals for Mexico, published by the Interministerial Pesticide Commission in 1988. According to Mexican Ministry of Health officials, the chemical is no longer going to be allowed to be used in Mexico. However, as mentioned earlier, pesticides may still be legally sold and used in Mexico for 2 years after they have been removed from the registration list.

In addition to EPA's canceling or suspending registrations because of health or environmental concerns, registrations may be voluntarily withdrawn by manufacturers. Table 2.2 shows the 1988 registration status in the five countries of 26 pesticides that EPA had included on its October 25, 1988, revised list of voluntarily canceled chemicals of significance.⁵ As the table shows, the five governments have also prohibited or not registered many of these pesticides.

⁵Chemical manufacturers cancel chemical uses for various reasons, including health and/or economic reasons.

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Table 2.2: Status in Five Countries of Pesticides on EPA's October 25, 1988, Revised List of Voluntarily Canceled Chemicals of Significance

Pesticide	Chile	Costa Rica	Dominican Republic	Guatemala	Mexico
Acrylonitrile	NR	NR	NR	NR	NR
Arsenic trioxide	NR	NR	NR	NR	NR
Benzene (all products)	NR	NR	NR	NR	NR
BHC (benzene hexachloride)	NR	NR	NR	P	R
Captafol ^a	R	R	R	R	R
Carbon tetrachloride	NR	NR	R	NR	NR
Chloranil	NR	NR	NR	NR	NR
Copper acetoarsenite	NR	NR	NR	NR	NR
Copper arsenate (basic)	NR	NR	NR	NR	NR
Cyhexatin ^a	R	R	NR	NR	R
Endrin ^b	P	R	P/L	P	NR
EPN ^a (O-ethyl O-p-nitrophenyl phenylphosphonothioate)	NR	NR	R	R	R
Erbon	NR	NR	NR	NR	NR
Hexachlorobenzene	NR	NR	NR	NR	NR
Lead arsenate ^a	NR	NR	NR	NR	NR
Monuron	NR	NR	NR	NR	NR
Nitrofen (TOK ^c)	NR	P	R	NR	NR
OMPA (Octamethylpyro-phosphoramidate)	NR	NR	NR	NR	NR
Pentachlorophenol (some nonwood uses continue)	NR	NR	NR	RS	R
Perthane	NR	NR	NR	NR	NR
Phenarsazine chloride	NR	NR	NR	NR	NR
Ronnel ^a	NR	NR	NR	NR	NR
Safrole	NR	NR	NR	NR	NR
Sodium arsenite ^a	NR	NR	NR	NR	NR
Strobane	NR	NR	NR	NR	NR
Trysben	NR	NR	NR	NR	NR

Legend

NR = Not registered for use

P = Prohibited

P/L = Prohibited; not removed from country's list of registered pesticides

R = Registered for use

RS = Restricted

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^aEPA has a tolerance(s) for this pesticide.

^bEPA has tolerances and action levels for this pesticide.

^cTrade name.

Source: EPA's Office of Pesticide Programs' Oct. 25, 1988, revised list of voluntarily canceled chemicals of significance; official pesticide registration documents, statutes, resolutions, and proclamations from five countries; 40 C.F.R. parts 180 and 185 (revised as of July 1, 1989); and The Pesticide Chemical News Guide, June 1, 1988.

Of the 26 pesticides whose U.S. registrations had been voluntarily canceled, 18, or 69 percent, were either prohibited or not registered in all 5 countries. Chile had not registered or had prohibited use of 24 of the 26 pesticides, or 92 percent; Costa Rica and Guatemala, both 23, or 89 percent; the Dominican Republic, 22, or 85 percent; and Mexico, 21, or 81 percent.

Providing Information on
U.S. Pesticide
Requirements

In each country, government officials emphasized that they believed that most export growers, particularly multinational firms and growers affiliated with national grower or exporter associations, independently obtain information on U.S. standards and are therefore unlikely to export produce that does not meet U.S. requirements. According to Chilean and Mexican officials, however, their governments also provide information on U.S. pesticide requirements to export growers, which assists them in making decisions about pesticide use on their export crops. The Chilean government, through pesticide labels, provides information to its growers on U.S. pesticide tolerances for specific crops. The Mexican government coordinates with a national association to provide U.S. information through a wall chart, which the association distributes to export growers.

Government officials in Costa Rica, the Dominican Republic, and Guatemala said that while they would like to be able to provide information on the United States' and other countries' requirements to their growers, they have not obtained adequate regulatory information on U.S. pesticide standards, such as 40 C.F.R. part 180, or other comprehensive commercial publications that incorporate U.S. regulations. They also said that it was primarily the export growers' responsibility to know and meet both the safety and quality requirements of their markets—as it is in the United States.

**Chile Provides Information
on U.S. Pesticide
Requirements on Pesticide
Labels**

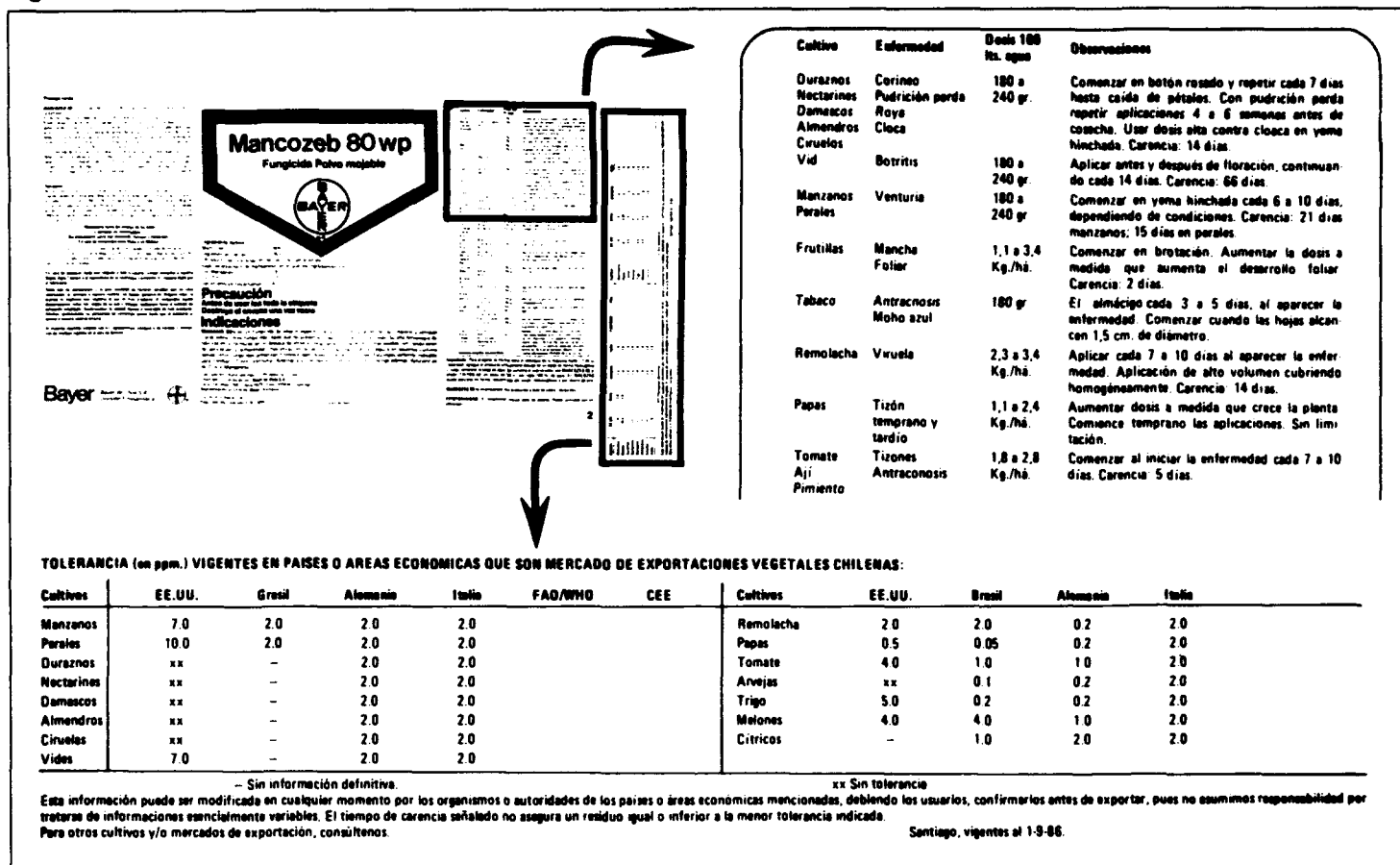
To assist its export growers in meeting the United States' and other countries' import requirements, the Chilean government requires information about major export markets' pesticide requirements, by crop, to be included on pesticide labels. Chilean officials gather information on export market requirements, particularly on tolerances and preharvest intervals,⁶ as part of the registration process. Chilean regulations require this information to be printed on the label in addition to the standard information on precautions, composition, hazard, and use.⁷ Further, Chilean regulations require a change in the pesticide label whenever the listed export markets' registration status changes. Figure 2.1 shows the Chilean label for the fungicide Mancozeb 80, with the highlighted portions showing use and tolerance information.

⁶Preharvest interval is the time in days required after application before an agricultural crop may be harvested to ensure that residues remaining are within legal tolerances.

⁷All five governments—in a standardization effort with other countries in the region—are changing their label format to try to reduce the misuse of pesticides. Each of the countries has adopted the FAO/WHO label format, in which the left side of the label lists precautions, the center contains information on the pesticide's chemical composition and a hazard sign, and the right side shows use information.

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Figure 2.1: Chilean Pesticide Label



As figure 2.1 shows, the label lists use information to the right of the name block and the tolerances for specific crops and export markets on the far right. For example, for the pest, corineo, on peaches (duraznos), the label recommends 180 units of Mancozeb 80 in 100 liters of water per hectare, repeated every 7 days. The export market tolerances reveal that the United States (EE.UU.) has not set a tolerance for Mancozeb 80 on peaches, alerting the Chilean export grower that use on peaches would be unacceptable if the peaches are intended for the U.S. market. At the same time, the label shows that Mancozeb 80's use would be acceptable if the peaches were intended for the German or Italian market.

Mexico Provides Information on U.S. Requirements Through a Wall Chart

In 1987 the Mexican Ministry of Agriculture and UNPH—the Confederation of Mexican Fruit and Vegetable Growers Associations—jointly published a wall chart for export growers, to provide all chemical/crop combinations and corresponding U.S. residue tolerances for Mexican export crops. According to Mexican officials, the chart was the first comprehensive document of U.S. regulations compiled specifically for Mexican export growers. As discussed in chapter 3, this chart generally provides Mexican export growers with the information needed to meet U.S. pesticide tolerances on their export crops.

Pesticides Registered Without EPA Tolerances

We identified 110 pesticides registered in 1 or more of the 5 countries as of 1987 or 1988 (see ch. 1, fn. 13) that do not have tolerances established for a food use in the United States. In some cases, the countries may have registered these pesticides (1) because of their specific pest problems, crops, and overall climatic conditions; (2) because the pesticides are suitable for nonfood uses; and/or (3) because exporters must have alternative pesticides legally available to them to meet the differing requirements of their export markets. While registering these pesticides may be appropriate to the countries' needs, use of any of the 110 pesticides on produce destined for export to the United States could result in no-tolerance violations, and the produce could be refused entry if FDA detects them. In some cases, EPA may not have evaluated these pesticides or may have denied a U.S. tolerance or registration.

The 110 pesticides we identified are detailed in appendix V. Table 2.3 shows the number of such pesticides for each of the five countries.

Table 2.3: Number of Pesticide Registrations With No EPA Tolerances in Five Countries

Country	Number
Chile	24
Costa Rica	42
Dominican Republic	50
Guatemala ^a	37
Mexico	35
Total	188^b

^aGuatemalan registration data included about 75 products whose active ingredients were not identified; these products are not considered in this calculation.

^bBecause some pesticides are registered in more than one country, the total exceeds 110.

Source: Pesticide registration lists for Chile, Costa Rica, the Dominican Republic, Guatemala, and Mexico.

**Most Violations on Imported
Produce Are No-Tolerance
Violations**

According to FDA reports, FDA data have consistently shown that most pesticide residue violations on imported produce involve no-tolerance violations rather than residue levels that exceed EPA tolerance levels. No-tolerance violations result when FDA detects residues of pesticides that do not have U.S. tolerances established for use on a particular crop in the United States. Over-tolerance violations result when pesticide residues exceed EPA's established tolerances and most often occur because of pesticide misuse, unusual weather conditions, or poor agricultural practice, according to FDA.

Each of the five countries has experienced no-tolerance violations on produce exported to the United States. In many cases, U.S. tolerances had not been established for the specific export crop, although a tolerance may have been established for a related crop. The effect of not having tolerances established for certain crops may be particularly severe for Costa Rica, Guatemala, and the Dominican Republic, which are trying to improve their economies through increased exports of non-traditional fruits and vegetables, such as chayote, yucca, and some Chinese vegetables. These commodities either are not grown or are not grown commercially in significant quantities in the United States and tend to have few, or no, U.S. tolerances. As a result, these countries' growers may face rejection of their produce at U.S. entry points because of potential no-tolerance pesticide violations. The following examples illustrate what happens when U.S. tolerances have not been established for specific crops:

- A representative of a chayote cooperative in Costa Rica told us that to control pests on its growers' crops, the cooperative was using a selection of chemicals that do not have U.S. tolerances for chayote. However, the chemical companies and the Costa Rican Agriculture Ministry had assured them these chemicals would break down in 4 days and therefore not leave residues on their exported chayote. The representative told us that the cooperative's growers were using these pesticides because EPA had not registered any chemicals or established any tolerances for any pesticide's use on chayote, and fungus problems, if not controlled, would result in severe economic loss.
- While EPA has set a tolerance level for permethrin residues on bell peppers, the tolerance does not extend to other specialty peppers. In 1986 Mexico experienced over 30 no-tolerance violations for permethrin residues that were detected on Mexican serrano, poblano, caribe, and other peppers. The residue levels were below the tolerance level for bell peppers but were in violation because tolerances had not been set for these particular specialty peppers.

- The Dominican Republic experienced many no-tolerance violations in 1987 and 1988 on imported fresh produce, including eggplant, peppers, squash, and snow peas. As was the case with the Mexican peppers, U.S. tolerances had been established for the pesticides on other food commodities, but not on the foods cited for violation. In December 1988 FDA ordered automatic detention of all shipments of long beans, snow peas, peppers, and fuzzy squash from the Dominican Republic because of the number of no-tolerance violations.⁸ In correspondence with Dominican Republic government officials, FDA officials noted that while the pesticides identified are not permitted for use in the United States on the violative imported crops, most often they are legal in the United States for use on other crops.

FDA import monitoring data show the extent of no-tolerance violations on imported produce. In fiscal years 1986 and 1987, FDA's inspection of fresh produce imports found 256 violations out of 5,676 samples, or 4.5 percent, and 427 violations out of 8,016 samples, or 5.3 percent, respectively. Of these violations, 230, or 90 percent, in 1986,⁹ and 390, or 91 percent, in 1987, occurred because U.S. tolerances had not been established for the food commodities sampled. The remainder resulted from residues that exceeded established EPA tolerance levels. In 1986 about two-thirds of the no-tolerance violations involved pesticides that had U.S. tolerances for commodities, including fruits and vegetables, other than the type cited for violation. (See table 2.4.) We did not make a similar analysis for other years.

⁸Under automatic detention, subsequent shipments of designated products are not permitted to enter the United States unless the shipper or importer can provide a valid certificate of analysis showing that the product does not contain illegal residues of the cited pesticides.

⁹Of these 230 violations, 8 involved 2 or more pesticide residues making a total of 241 violative pesticide residue findings.

**Table 2.4: Reasons for No-Tolerance
Pesticide Residue Findings for Imported
Foods in Fiscal Year 1986**

Reason for violation	Violations	
	Number	Percent
The pesticide had a U.S. tolerance for one or more fruits, vegetables, and/or other commodities, but not for the commodity cited for violation	155	64
The pesticide was not registered for any use in the United States; or the pesticide was registered, but no tolerances had been established for a food use application	72	30
The pesticide was canceled or severely restricted in the United States, and previous food use tolerances were revoked ^a	14	6
Total	241	100

^aFor enforcement purposes, EPA has established action levels for canceled or severely restricted pesticides because several of these chemicals can persist in the environment for many years. Action levels are regulatory limits at or above which FDA generally can take legal action to remove foods from commerce. On Feb. 19, 1988, FDA announced in the Federal Register (53 Fed. Reg. 5043) that, in response to a court ruling, action levels were not binding on FDA, industry, or the courts, although they could be used as guidelines. In 10 of these 14 cases, the residue levels present in the violative samples were below action levels for commodities in the same or other food groups.

Source: Our analysis of FDA fiscal year 1986 import monitoring data.

As table 2.4 shows, almost two-thirds of the no-tolerance residue findings for the import violations in 1986 involved pesticides with U.S. tolerances for other commodities, including fruits and vegetables, but not for the commodities cited for violation. In such cases, the residue findings may not necessarily be indicative of pesticide misuse or poor agricultural practice. In addition, of the 72 residue findings in the second category, 66 involved a single pesticide—procymidone—on grapes from Chile, Italy, New Zealand, and South Africa.

Controls Over Pesticide Availability and Use

According to FAO guidelines, monitoring and enforcement activities are needed to help ensure the integrity of governments' pesticide registration systems and to help prevent the illegal use of pesticides and the resultant risks to health and the environment. The guidelines state that monitoring and enforcement programs should verify that only legal, properly registered products or their components are imported and that chemicals offered for sale have the exact formulations indicated on container labels. In addition, the guidelines specify that after registering a product, governments should exercise control over residues found in food for the protection and reassurance of the consumer and to ensure the acceptability of agricultural commodities in trade.

Government officials in each of the countries except Chile told us that government monitoring and enforcement activities, particularly monitoring pesticide availability and field sampling for residue testing, were generally limited because of such resource constraints as lack of inspectors, lack of transportation to monitor distributors and perform field sampling, and inadequate residue testing facilities. Subsequent to our visit, Chilean officials indicated in an FAO survey that they believed that adequate resources were available in their country to effectively manage the availability, distribution, and use of pesticides.¹⁰

While the officials told us that their countries had few monitoring resources, we found that limited residue testing had been done for domestic crops in Mexico, Chile, Costa Rica, and Guatemala and that, in some cases, university and government laboratories had provided residue testing to export growers for a fee. Some of the countries were seeking assistance in improving their laboratory capabilities. For example, Costa Rican officials told us that they were seeking FAO funding for increased laboratory facilities and that an FDA representative had been detailed through PAHO to work with Costa Rica's Ministry of Health to improve laboratory testing capabilities. In addition, Mexico informed FDA in May 1988 of plans to establish regional laboratories that will provide a variety of analytical services, including pesticide residue testing of both imported and exported products.

Observations

Because each country registers pesticides on the basis of its own climate, crops, and pest problems, an exporting country faces a maze of pesticide requirements that may differ from its own and that may not necessarily be health-related. These variations can particularly affect developing countries that are trying to increase exports but have few resources available to identify the differences between countries' pesticide/crop combinations and tolerances. Many countries, such as the United States, have complex systems of pesticide registration and tolerance-setting, and their tolerances are not always the same as international Codex maximum residue limits, which the newer exporting countries we visited have adopted. In addition, the exporting countries may have different pesticides registered for use on a given crop, or they may have the same pesticide registered, but for use on different crops.

¹⁰Response to Questionnaire to Governments on the International Code of Conduct on the Distribution and Use of Pesticides, FAO, Rome, Jan. 1989.

To more effectively compete in world agricultural markets and deal with the maze of requirements and systems, export growers and exporters need to obtain more information on other countries' requirements. The governments in the countries we visited expect export growers and exporters to take primary responsibility to know and meet the importing requirements of their export markets. Most of these governments have resource constraints that affect their ability to obtain and disseminate information on other countries' requirements and to conduct monitoring and enforcement activities relating to pesticide availability and use.

In most cases, government officials told us that their countries lacked information about U.S. requirements. However, in two of the five countries, the governments had taken action to provide their export growers with information about U.S. pesticide requirements, which assists their growers in making appropriate decisions on pesticide use for their export crops. Government officials in the other three countries expressed interest in obtaining more information on U.S. import requirements but, at the time of our review, had not yet established the necessary information networks. U.S. agencies are assisting some countries' export growers in obtaining information about U.S. pesticide requirements. These efforts are discussed in chapter 4.

Despite a general lack of information about U.S. pesticide/crop requirements, the countries we visited had prohibited or not registered most of the 52 pesticides listed in tables 2.1 and 2.2, which the United States had canceled or suspended as of October 1988 either through EPA's regulatory action or through voluntary cancellation by chemical manufacturers. While such pesticides are not legally available in these countries, constraints in monitoring and enforcement capabilities may contribute to lingering concern that these pesticides, although not legally sanctioned, may be available for use on domestic and exported produce.

Private Sector Efforts in Five Foreign Countries to Meet U.S. Safety and Quality Requirements

The governments in the five countries do not design food safety and quality systems to ensure that exports meet U.S. safety and quality standards. Moreover, the governments expect growers and exporters to take primary responsibility to know and meet such standards. Exporters and export growers in these countries try, to varying degrees, to ensure that fruit and vegetable exports meet U.S. pesticide residue requirements. The extent to which the exporters and growers are able to do this, however, generally depends on their length of experience in exporting produce and on access to information and technical assistance.

Multinational firms, their contract growers, and other experienced export growers are more likely than less experienced export growers to use pesticide management practices that consider U.S. pesticide requirements. Multinational firms' and experienced export growers' practices are most often directed by the policies, information, and technical services provided by their firms or by older, national exporter/grower associations. The less experienced export growers are generally affiliated with newer grower/exporter associations, which have fewer support services in place to assist export growers in meeting their export markets' pesticide requirements. Growers who produce for domestic consumption are governed by their countries' safety and quality requirements only and do not have an economic incentive to be part of an information network or to develop management practices that ensure compliance with the United States' or other countries' requirements.

On the matter of quality, the exporters determine what the quality of exported produce should be largely on the basis of their knowledge of the importing countries' quality requirements and changing market demands. Most of the export growers and exporters we spoke with were aware of U.S. marketing order requirements and tended to sort produce for export to the United States according to these minimum requirements and/or importer specifications—either verbal or written. Representatives of multinational firms told us that their companies' standards are further dictated by their assessment of customer preferences.

Export Growers and Their Pesticide Management Practices

Within the five countries, the export sectors have assumed responsibility for ensuring that their crops exported to the United States meet U.S. pesticide requirements. The fruit and vegetable growers in the export sectors include (1) experienced multinational firms; (2) other experienced growers affiliated with older, national exporter/grower associations (Chile and Mexico); or (3) less experienced export growers

affiliated with newly organized, national associations (Guatemala, Costa Rica, and the Dominican Republic).

The export growers we contacted told us of a variety of pesticide management practices that many of them used to help meet U.S. pesticide requirements for fresh fruits and vegetables. These practices included the following:

- Obtaining available information on EPA pesticide tolerances for produce destined for export to the United States.
- Developing pest control plans consistent with the information on EPA requirements.
- Supervising pesticide selection and application and creating and monitoring crop- or field-specific records of chemicals purchased, received, and used (including pesticide used, field location, dosage, and date).
- Performing routine or periodic residue testing to ensure that pesticide residues on exported produce do not exceed U.S. tolerances.
- Enforcing pest control plans.

However, not all export growers had used each practice or used specific practices to the same degree. Multinational firms in each country and experienced export growers in Chile tended to have most of these management practices in place. In Mexico, experienced export growers varied in terms of the number of practices they used. However, they tended to use practices that were more consistent with U.S. pesticide requirements, while the practices of the less experienced export growers in the other countries—Guatemala, Costa Rica, and the Dominican Republic—usually did not. The following sections discuss, for each type of grower, the extent to which pesticide management practices that consider U.S. requirements had been or were being used.

Multinational Firms

According to the five multinational firms we contacted in Chile, Costa Rica, the Dominican Republic, and Guatemala, management practices were in place to help ensure that their exported produce meets U.S. safety and quality standards because U.S. detention of their produce could result in serious revenue loss. The commodities they export, such as bananas, pineapples, melons, apples, grapes, and peaches, are grown either by the firms' employees on company-owned land or by contract growers. These firms generally implement management practices through internal controls. These controls include pest control plans based on U.S. pesticide regulatory information and monitoring practices to ensure compliance with the plans.

Information on U.S. Import Requirements Is Applied in Pesticide Management Plans

Each of the five multinational firms had written pest control plans that, according to their officials, were consistent with EPA pesticide standards for commodities exported to the United States. Four of the firms had used U.S. regulatory information on U.S. pesticide requirements, and the fifth had used technical publications, to develop and update their written plans. These plans, which deal with anticipated pests and disease, cover each crop the firms handle and specify the chemicals permitted, dosage, frequency of use, and preharvest interval.

For example, one multinational firm exporting bananas and pineapples from Guatemala and Costa Rica provides lists of approved chemicals in its operating manual. According to the manual, the lists are based on EPA's regulations. The firm requires its technical division in the United States to approve, in advance, all pesticides used, including those used in emergency situations, such as an unanticipated outbreak of a pest or disease. The operating instructions specify how each pesticide should be used for each crop, including dosage and preharvest intervals. Officials of another multinational firm, which also uses U.S. pesticide regulatory information, told us that the firm's agronomists, during their twice-weekly monitoring of all growers, specify changes in how pesticides should be used according to the firm's approved list.

Multinationals' Controls Over Pesticide Use

The multinational firms we contacted had controls over acquisition and use of pesticides applied to their export crops. Their officials told us that the firms also supply pesticides used by their contract growers, arrange sources of purchase, or apply pesticides for them. Further, they said the firms provide access only to pesticides EPA has approved for use on the export crops and according to the written pest control plans they provide to growers. They also employ agronomists to supervise employees' and contract growers' implementation of the approved pest control plans. Additionally, while recordkeeping methods (including use of vouchers, warehouse receipts, diary notes based on direct observation, and grower-signed spraying receipts) used to monitor pesticide access and use varied among the firms, all methods tied the pesticide used to the crop and application date.

Multinationals' Use of Pesticide Residue Testing

Officials of only one multinational firm told us that it regularly tests its commodities for pesticide residues. However, representatives of some of the others said that their firms obtain pesticide residue testing under certain conditions, such as when they change written pest control plans, to ensure their fresh produce meets U.S. pesticide requirements. Overall,

these firms depend on good agricultural practices resulting from their internal controls to ensure that their exports meet U.S. pesticide requirements.

However, the representatives told us that when they obtain residue testing, they use laboratory services outside the exporting country because expeditious service is unavailable within their countries. Therefore, if residue testing is needed, the produce generally is not tested before shipment. For example, the president of one multinational firm in Guatemala told us that the firm cannot get residue testing done in Guatemala in less than 3 weeks. Therefore, when residue testing is necessary, the firm obtains it in the United States after shipment.

Multinationals' Use of Quality Controls

According to their representatives, most of the multinational firms work toward quality standards set by the company. The representatives said that these standards were dictated by customer preferences and were related primarily to a commodity's size and appearance.

Other Experienced Export Growers

Other experienced export growers that we spoke with were affiliated with older, national exporter/grower associations and tended to have management practices in place that help them meet U.S. safety and quality requirements. We identified these types of growers in Chile and Mexico, where most export growers belong to such associations. However, grower implementation of these practices varied between the two countries and among the growers in Mexico.

Like multinational firms, more of these growers (than of the less experienced export growers we visited) used management practices that address U.S. safety and quality requirements, primarily because of the economic incentive—52 percent of Chile's and about 90 percent of Mexico's produce exports go to U.S. markets. The exporter/grower associations in Chile and Mexico provide the experienced growers with a variety of services designed to ensure that their members meet their export markets' import requirements. These services include (1) obtaining information on U.S. requirements and (2) providing technical assistance, such as developing pest control plans, assisting with residue testing, and providing quality inspections.

Most Mexican Export Growers Are Assisted by the Confederation of Growers Associations

In Mexico, the government requires its export growers to be members of either UNPH or another exporter organization registered with the Mexican government. According to its president, most export growers are members of UNPH. UNPH provides its members with many of the resources necessary to meet U.S. pesticide requirements. According to Mexican government and UNPH officials, the Mexican government relies on UNPH and its regional associations to ensure that export growers meet U.S. pesticide and quality requirements.

To help meet this goal, UNPH provides its export growers with services ranging from providing information on which pesticides are legal in the United States on Mexico's export crops; to written pest control plans, such as spray schedules; to monitoring of use through residue testing. UNPH's level of assistance, however, is not the same across all export-growing areas. For example, it provides written pest control plans and residue testing to areas that have less access to U.S. information and that have experienced export problems. It also provides residue testing in areas that export the most produce.

Until sometime in 1988, the Mexican government had assigned UNPH the authority and responsibility for issuing export permits for fruits and vegetables. This authority had allowed UNPH to impose quality and pesticide use controls by making adherence to lists of U.S.-approved pesticides for use on export crops a condition for issuing an export permit. UNPH and Mexican government officials told us that, given this authority, UNPH had controlled about 97 percent of Mexican exports through conditions stated in the export permits.

In November 1988, however, UNPH's president reported at UNPH's national convention that government policy had shifted from a system with controls and regulatory mechanisms over planting and exports to a more decentralized system. He also reported that the government was no longer requiring the export permits previously required for all exported crops. In July 1989 UNPH's U.S. manager told us that this policy change had resulted in an increase in "bad produce" being shipped to the United States by small, inexperienced domestic growers, which depressed prices and hurt Mexico's image as a produce exporter.

UNPH also works on the regional level in Mexico to solve export problems. It has established regional associations in 24 of the 32 Mexican states. The 24 regional associations represent 214 local unions with about 20,000 fruit and vegetable export growers.

UNPH reported that the top five Mexican exporting states (in order of exported volume, Sinaloa in western Mexico, Baja California and Sonora in northwestern Mexico, and Michoacan and Tamaulipas in central and northeastern Mexico) were responsible for over 85 percent of Mexico's fruit and vegetable exports in the 1986-87 growing season, and 84 percent in the 1987-88 growing season, with Sinaloa accounting for 48 percent and 45 percent, respectively. In addition, according to their regional association, Sinaloa growers produce about half of all vegetables exported to the United States during the winter vegetable season.

According to UNPH officials, export growers in the western, northwestern, and northeastern states tend to be more sophisticated and well-educated and have large landholdings; export growers in the central state are generally less sophisticated and educated and farm smaller areas of 10 to 20 hectares.

UNPH Provides Information on U.S. Pesticide Requirements

According to its officials, UNPH gathers information on the most current U.S. pesticide regulations and distributes it to export growers to facilitate exports and decrease rejections of Mexican produce at the U.S. borders. The officials said that UNPH recognizes that many export growers in northwestern Mexico are physically close to the United States and therefore have easier access to direct sources of information on U.S. requirements. Nevertheless, UNPH supplies information on U.S. standards to all Mexican export growers to ensure that they have access to accurate information. According to the officials, UNPH's primary source of information on U.S. pesticide requirements is a Washington, D.C.-based industry representative.

Regional UNPH associations distribute information on U.S. pesticide requirements to local grower unions and individual growers primarily through the wall chart, mentioned in chapter 2, which details all chemical/crop combinations and corresponding U.S. residue tolerances for Mexican export crops. FDA's Los Angeles district pesticide coordinator, who examined the chart, told us that the chart is accurate, with one exception: omethoate, which does not have a U.S. registration or tolerance, was listed as legal on major export crops, such as bell peppers, tomatoes, and cucumbers. FDA detected illegal omethoate residues on some Mexican shipments sampled at the U.S. border in 1988, and many Mexican shipments were refused entry. FDA officials estimated losses to Mexican exporters/growers at over \$40 million. Mexican government officials told us that they would seek U.S. tolerances for omethoate and

other chemicals specifically required for production in the Mexican environment.

UNPH also distributes information on changes to EPA regulations through monthly newsletters. For example, UNPH's January 7, 1988, newsletter announced that a temporary U.S. tolerance of 7 parts per million for tiodicar (an insecticide) on broccoli became effective in October 1987.

UNPH Provides Some Written Pest Control Plans

In Mexico's more sophisticated export states, such as Sinaloa, Baja California, and Sonora, growers routinely develop their own spray schedules using the information provided in the wall chart. However, UNPH has developed and distributed standardized spray plans for its members in some of Mexico's less sophisticated export states.

For example, the regional UNPH association distributed a spray schedule for growers in Zamora, Michoacan, who grow strawberries exclusively for export to the United States. The spray schedule was based on information in the wall chart. It detailed the strawberry pest or disease to be treated with each pesticide, the proper mix, and dosage rate. We found that the spray schedule's information agreed with U.S. regulations for strawberries.

UNPH and Mexican Export Growers' Controls Over Pesticide Use

UNPH officials told us that they do not routinely monitor export growers' selection and use of pesticides in Sinaloa, Baja California, and Sonora—except for random field sampling for residue testing in Sinaloa—because growers in these areas are very experienced and have access to technical assistance needed to meet U.S. requirements. The officials said, however, that in the central export-growing areas, such as Michoacan, where technical assistance is not readily available, the local UNPH associations provide assistance, such as purchasing pesticides that meet U.S. requirements and reselling them to export growers. UNPH officials said that they believe that this assistance provides an economical source of pesticides for smaller export growers and encourages the use of pesticides that are legal in the United States on Mexican exports. UNPH officials acknowledged, however, that these growers still have the option of obtaining pesticides from local suppliers.

Use of pesticide purchase and application records varied among the export growers we talked with. Export growers in Michoacan and Tamaulipas tended to not have purchase and application records. UNPH grower members in Baja California and Sinaloa, however, told us that

they track their pesticide application by using logs and diaries to note their choice of pesticides and the fields treated.

UNPH's Use of Pesticide Residue Testing

UNPH provides preexport residue testing in two of the four exporting states we visited, Michoacan and Sinaloa. According to UNPH officials, this testing is provided because Michoacan growers have experienced pesticide residue problems in the past, and Sinaloa accounts for almost half of Mexico's exported produce to the United States. The officials said that growers in other major exporting states, including Baja California and Tamaulipas, obtain residue testing at their own discretion. During the 1987-88 growing season, UNPH performed about 1,300 preexport residue tests for strawberry growers in Michoacan and about 1,000 for growers in Sinaloa.

In Michoacan, where one of the primary export crops is strawberries, UNPH relies on private laboratories and limits its testing to two pesticides—azodrin and monitor—that it knows growers are likely to use but that are illegal for use on strawberries in the United States. The local association president told us that UNPH expelled 12 growers during 1988 because the laboratories found residues of the 2 chemicals. UNPH denied export permits to these growers for shipments containing violative residues.

UNPH officials told us that in Sinaloa, Mexico's major exporting state, UNPH performs a broader range of testing. These officials said that they try to identify residues of 50 commonly used pesticides using FDA's multiresidue method, which identifies a number of pesticide ingredients in a single procedure. UNPH has a laboratory in Sinaloa dedicated to pesticide residue testing of export crops and staffed by an FDA-trained technician. The laboratory performs field sampling at harvest and provides follow-up testing if growers receive FDA violations.

UNPH's Efforts to Control Quality of Mexican Export Crops

U.S. importers of Mexican produce contract with USDA's Agricultural Marketing Service to grade UNPH growers' produce at the U.S. entry point, primarily in Nogales, Arizona, according to an AMS official. AMS' district manager in Nogales told us that in recent years UNPH required that about 80 percent of the produce meet U.S. No. 1 grade requirements. According to UNPH's U.S. manager, the exporters, together with their U.S. partners, where they exist, determine what the quality of exported produce should be, largely on the basis of their knowledge of the United States' or other markets' quality requirements and changes in consumer demands.

In December 1988 USDA reported that the Mexican export licensing requirement for fresh fruits and vegetables had been dropped, and in September 1989 UNPH informed AMS' district manager in Nogales that UNPH would not require minimum inspections for the 1989-90 growing season. UNPH was previously authorized by the Mexican government to issue export permits for horticultural products. During the time UNPH had authority to issue export permits, it used the requirements stated in the permits to control its grower members' attention to quality. According to UNPH's president, UNPH tried to compensate for the loss of control over export permits by increasing its physical presence at border crossings with the greatest problems and documenting all export shipments with a new form.

According to AMS estimates, almost half of the fresh fruit and vegetable imports from Mexico from 1985 through 1987 were required to meet minimum quality standards under U.S. marketing order legislation. Most of the inspected produce was tomatoes—averaging over 810 million pounds a year. Other AMS-inspected produce included onions, limes, table grapes, oranges, and grapefruit.

**Chilean Export Growers
Are Assisted by Their
National Exporters
Association**

The Chilean exporters association (Asociacion de Exportadores de Chile A.G.) facilitates the export process for Chilean fruit and vegetable exporters/growers and tries to ensure that Chilean growers use management practices that help them meet their export markets' requirements. The association's executive director told us that its members handle about 95 percent of all Chilean fruit and vegetable exports. The association provides information on the import regulations of Chile's export markets, which augments information exporters have obtained independently. The association also provides pest control plans for certain export fruit crops, such as grapes and tree fruit.

According to government officials, Chilean exporters contract with growers for production of export commodities and include provisions for controlling pesticide use in the contracts. The Chilean exporters we spoke with also monitor grower selection and use of pesticides and arrange residue testing when needed.

**Chile's Exporters Association
Provides Information on U.S.
Requirements**

The Chilean exporters association gathers information on current U.S. pesticide requirements and distributes it to exporters and export growers. It also funds research on pesticide use in Chile to determine what constitutes good agricultural practices in Chile's climate.

The association obtains information on U.S. regulations from FDA, EPA, the Chilean government, and the Chilean representative to Codex. At a 1986 association seminar, for example, FDA and EPA officials presented information on U.S. laws governing pesticides, FDA's policies and procedures for regulating pesticide residues in imported foods, EPA's registration and tolerance-setting procedures, and steps that Chilean authorities should take to ensure that Chilean produce exports meet U.S. pesticide requirements. According to the Director of FDA's Contaminants Policy Staff, the Chilean organizations were committed to and had the capability for ensuring that pesticide use on produce destined for U.S. markets would conform with EPA's requirements.

Since 1980 the association has summarized information on U.S. pesticide requirements and annually published and distributed a manual identifying pesticides, residue tolerances, and preharvest intervals allowed on fruit crops exported to the United States. Information on regulations in Chile's other export markets, primarily Europe and Japan, was added in 1984. We found that the pesticide recommendations in the 1987-88 manual agreed with U.S. tolerances. The manual also indicated available pesticides that are not registered in the United States.

Until recently, the association published information needed by fruit exporters only. Association officials told us that the association was planning to expand its programs to serve vegetable growers as well.

To further ensure that Chilean exports meet U.S. requirements, the association funded university research to determine if residues resulting from use according to label instructions are the same in Chile as in the United States. The studies showed that several pesticides left residues for longer periods of time when used in Chile. As a result, the association modified the manual's guidelines for several pesticides, lengthening the preharvest period, to ensure that residues do not exceed U.S. tolerances.

Chile's Exporters Association Develops Pest Control Plans Based on U.S. Standards

The Chilean exporters association contracts with an expert at the University of Chile to develop pest control plans for each of Chile's major export crops destined for the United States. These plans are available to all exporters and growers free upon request. According to the five exporting firms we contacted, which accounted for about 42 percent of Chile's exports in 1987, the firms had received the information and spray plans from the association and had provided their growers with pest control plans that met U.S. standards for commodities grown for the U.S. market. In their contracts, these exporters require growers to

follow these plans. The pest control plans we reviewed identified the pest or disease to be treated with each pesticide for each crop and the dosage rate. The plans also provided alternative treatments that conform to U.S. requirements.

Chilean Exporters' Controls Over Pesticide Use

Chilean exporting firms told us that they routinely monitor selection and use of pesticides by their contract growers through their agronomists, who regularly supervise up to 15 growers each. Growers are required to follow a firm's spray plan unless a substitution is approved in writing by the agronomist. Records of 16 growers growing for 4 of the 5 firms showed that the firms' agronomists had supervised growers weekly during the early growing season and more frequently during the harvest period to ensure implementation of the spray plans. The other firm, a cooperative, has its agronomists visit its growers about every 2 weeks.

Representatives of Chile's Chemical Producers Association told us that 75 percent of all agricultural pesticides used in Chile are supplied to growers by exporters. Some of the remaining 25 percent are purchased directly with growers' own funds; the rest are charged to an exporting firm's account by its growers. This firm is one of the multinational firms we contacted. Because growers can charge chemicals only on the firm's authorized list, they obtain only approved chemicals from this source.

The 21 Chilean export growers whose records we reviewed also kept records of pesticide purchases and application information. The agronomists told us that they monitor field production, including checking growers' application records, to ensure that only approved pesticides are used.

Chilean Exporters' Use of Pesticide Residue Testing

The Chilean exporting firms told us that they do not routinely test fruit for residues before export but rely on their other management practices to ensure that U.S. safety and quality requirements are met. They arrange pesticide residue testing if they have problems during the growing season, such as a need for later-than-normal spraying. For example, the largest fruit exporting firm in Chile told us that it sometimes uses three laboratories for intermittent testing, SGS and NutriClean in the United States and Fundacion Chile (a quasi-government institution) in Chile. According to a firm representative, the produce is not shipped if violative residues are found. The other exporting firms told us they similarly arrange residue testing if needed.

Chilean Exporters' Use of Quality Controls

According to Fundacion Chile officials and representatives of the firms we spoke with, Chilean growers have a variety of quality controls in place. Fundacion Chile officials told us that Fundacion Chile performs quality control inspections on 10 percent to 12 percent of all Chilean export produce and that Fundacion Chile's standards exceed Chile's domestic quality standards. This produce is marked with a quality certification seal. In addition, an APHIS official in Chile told us that Chilean exporters use AMS' voluntary inspection service during periods when U.S. marketing orders are not in effect.

According to AMS estimates, about 19 percent of the fresh fruit and vegetable imports from Chile from 1985 through 1987 were required to meet minimum quality standards under U.S. marketing order legislation. Most of the marketing order-related inspections were for table grapes—averaging about 110 million pounds a year—but also included avocados and onions.

Less Experienced Export Growers

In Costa Rica, the Dominican Republic, and Guatemala, which have a shorter history of exporting fruits and vegetables to the United States than do Mexico and Chile, most export growers, other than multinational firms growing traditional high-volume export crops, are new to the export business and are affiliated with relatively new national associations.¹ These less experienced growers tend not to have management practices in place that specifically consider U.S. safety and quality requirements for their export crops. They have fewer resources, including fewer sources of information on U.S. pesticide requirements, and the information they obtain may be inconsistent or inaccurate. The less experienced growers that we contacted in these countries had small farms, usually under 100 acres, and grew lower volume nontraditional and specialty export crops, such as Chinese vegetables, cauliflower, strawberries, melons, and chayote—mostly for the United States.

Officials of these countries' grower/exporter associations indicated that they were seeking and developing information on U.S. requirements to provide to their export growers. In these countries, export growers were experiencing significant difficulty in exporting certain crops to the United States because of a lack of information on U.S. pesticide requirements and because, in many cases, the United States has not established tolerances for pesticides used on these crops.

¹ For example, Guatemala's national association, GREMIAL, was established in 1982 and Costa Rica's CAAP in 1985.

According to AID documents, much of these countries' increased agricultural efforts grew out of Caribbean Basin Initiative (CBI)² projects to expand the countries' economies by increasing exports of nontraditional fruits and vegetables primarily directed at the U.S. market. In these countries, most export growers are therefore new to the export business. CBI workshop projects have focused on developing and marketing the crops for export and, according to a USDA official, little attention has been given to providing information on pesticide inputs. According to this official, however, the workshop participants have consistently asked for specific information about what pesticides can be used on specific export crops destined for the United States. As discussed in chapter 4, new U.S. AID projects are addressing the exporters' need for U.S. pesticide information.

Role of National Grower/ Exporter Associations in Costa Rica, the Dominican Republic, and Guatemala

According to association officials, the national grower/exporter associations represent about 80 percent of the export growers in Guatemala, about 60 percent in the Dominican Republic, and almost all the export growers in Costa Rica. These associations, which were established to help expand and improve their countries' agricultural export industries, perform a variety of services, such as providing marketing and financing of exports for their members. However, they do not provide information on their members' export markets' pesticide requirements or technical assistance in pest management. As previously mentioned, each of these associations was seeking information on U.S. pesticide requirements at the time of our visits.

New Export Growers in the Three Countries Have Limited Information on U.S. Pesticide Requirements

The export growers, exporters, grower/exporters, and exporter associations we contacted in the three countries said that they had insufficient sources of information on U.S. pesticide requirements. While the Guatemalan and Costa Rican associations had some commercial pesticide publications, only one publication showed U.S. pesticide requirements. None of the associations had official U.S. government sources of information, such as EPA's regulations on pesticide tolerances.

Most export growers we contacted in Guatemala and Costa Rica said that they had received some information from U.S. contacts or commercial publications; however, none of the growers said that they had

²The 1983 Caribbean Basin Economic Recovery Act (P.L. 98-67, 97 Stat. 384) provided new trade and tax measures to promote economic revitalization and expanded private sector opportunities in the Caribbean Basin region. Areas covered in this initiative include the Caribbean island nations and Central America.

access to official U.S. regulatory sources of information. In the Dominican Republic, the growers told us that they did not have information on U.S. requirements. At the time of our visits, the association in each country was exploring how export growers and exporters can access critically needed information on U.S. pesticide requirements.

**New Export Growers Lack
Written Pest Control Plans
That Consider U.S.
Requirements**

Except for one grower, none of the growers, exporters, grower/exporters, or exporter associations we contacted in the three countries had developed written pest control plans that reflect U.S. pesticide requirements. They said that they lacked information on such requirements. However, over half the growers, exporters, and grower/exporters told us that they used the practice of preplanning what pesticides would be used on their export crops. Of the 12 growers, exporters, and grower/exporters we contacted in these countries, 5 had developed plans and 7 had developed lists to guide the selection and use of pesticides. However, only 1 of the 12, an exporter, had a plan consistent with U.S. pesticide requirements. Others' plans or lists included one or more pesticides that are not approved for use on the specific crop being grown for export to the United States.

The exporter associations also had not developed pest control plans to improve the use of pesticides by growers of nontraditional export crops. Nonetheless, officials of the Dominican Republic and Guatemalan associations told us that they would provide such assistance to their members if they could obtain official information on U.S. rules.

**New Export Growers'
Controls Over Pesticide
Use**

Of the 12 growers, exporters, and grower/exporters we contacted in the 3 countries, 8 told us that they monitored pesticide application to some extent; however, as with the pest control plans discussed above, they said that U.S. pesticide requirements did not form the basis of such monitoring. About half the growers we talked with maintained pesticide application records, including charts, diaries, and agronomists' recommendation records; and about two-thirds of the growers, exporters, and grower/exporters told us that they were periodically advised by an agronomist.

**New Export Growers' Use
of Pesticide Residue
Testing**

The 12 growers and exporters we contacted in the 3 countries told us that they generally had not obtained residue testing before exporting their crops, primarily because of a lack of timely access to adequately equipped laboratories.

In the Dominican Republic, government officials told us that neither government nor private testing laboratories were available for export growers' use. They said that because of a lack of supplies and equipment, their government's laboratory had been inoperative since September 1986.

In Costa Rica and Guatemala, limited laboratory services were available to produce exporters from government or government-sponsored laboratories for residue testing on a fee-for-service basis. However, our discussions with some laboratory personnel in these countries indicated that a small number of tests had been conducted for produce exporters. Officials of the National Pesticide Commission in Costa Rica told us that the Commission was exploring ways to provide residue testing services for exporters and others.

Observations

Multinational firms in the five countries and experienced exporters in Mexico and Chile had the most management practices in place that take into account U.S. pesticide requirements. Most importantly, these firms and exporters had significantly more information available on U.S. pesticide requirements and had mechanisms in place to ensure that such information was updated.

The export growers in Costa Rica, the Dominican Republic, and Guatemala, except for the multinational firms, are less experienced in exporting fruits and vegetables to the United States. While these countries' export volumes are expected to increase, they had minimal practices in place to ensure that U.S. pesticide requirements are met. These exporters had some management practices in place to monitor pesticide use to some degree. However, the practices offered little assurance that their export crops would meet U.S. requirements because, in almost all situations, these export growers and exporters lacked information about pesticides allowed on those fruits and vegetables in the United States.

Because increased exports of fruits and vegetables are planned in these countries, and as FDA implements provisions of the Pesticide Monitoring Improvements Act of 1988, a failure to meet U.S. pesticide requirements may jeopardize the economic growth of these countries and the success of U.S. projects planned to increase nontraditional agricultural exports in these countries. At the time of our visits, export growers, exporters, and exporter associations in these countries were seeking information

Chapter 3
Private Sector Efforts in Five Foreign
Countries to Meet U.S. Safety and
Quality Requirements

on U.S. requirements. In addition, U.S. agencies were expanding different types of assistance, which should prove timely to these efforts. (See ch. 4.)

To the extent that export growers and exporters use the pesticide management practices mentioned in this chapter—particularly obtaining and following information on pesticides allowed on export crops to the United States—the United States will be less likely to experience illegal pesticide residues on fruits and vegetables presented for import from these five countries. Further, consumers will have better assurance that only pesticides with approved U.S. tolerances have been used in producing imported produce.

U.S. Agencies' Efforts to Assist Foreign Countries in Meeting U.S. Safety Requirements

Several U.S. agencies have provided or are providing pesticide-related training or technical assistance to developing countries, which could influence their abilities to meet U.S. safety requirements on produce exported to the United States. This chapter discusses the efforts of EPA, FDA, USDA, and AID. We did not verify these efforts or evaluate their effectiveness.

Environmental Protection Agency

EPA offers assistance to developing countries through its Offices of International Activities and Pesticide Programs, conducting workshops, consultations, and ad hoc training seminars. One objective of these activities is to improve the developing countries' management of pesticides. These activities indirectly contribute to protecting the health and welfare of U.S. citizens when food is imported from these countries.

EPA's primary effort to assist developing countries with pesticide controls has been to implement regional workshops developed in collaboration with AID, FDA, and such international and regional organizations as FAO and WHO. The workshops are designed to upgrade the technical skills of regulatory and enforcement officials and scientists in developing countries and to facilitate information exchange about key regulatory issues among countries in the region and between these countries' regulatory agencies, EPA, and other governments and international organizations. According to the Director of EPA's Developing Countries Staff, one workshop component has also focused on the need for developing a residue testing system for exports to ensure that exported foods do not contain pesticide residues that could prevent acceptance by the importing country. In addition, he said that workshop officials have provided sources of information about pesticide use and U.S. government contacts for additional information.

One workshop was held for the Asia and Pacific region during 1988, with two follow-up workshops during 1989. A workshop for the Latin American region was held in January/February 1990.

EPA has also offered ad hoc training seminars, consultations, and training on pesticide residue testing to countries on request and has been involved in ongoing programs to help improve countries' data bases of pesticide information through the United Nations Environmental Program (UNEP) and FAO. In addition, it has worked with international organizations in regional and global efforts to improve pesticide use.

EPA's records indicate that of the 39 foreign visits to EPA during 1987 and 1988 from the 5 countries we contacted, 3 were related to pesticide issues. The chief of EPA's analytical chemistry laboratory told us that no one from the five countries had participated in EPA's residue analysis training over the past several years.

According to an Office of International Activities' document, since late 1986, EPA has divided its approach in assisting developing countries to develop or improve their pesticide controls. For the poorer nations, EPA's approach has been to emphasize collaboration with, and support for, existing development assistance agencies, particularly within the framework of U.S. development assistance policy through AID. EPA's technical service memorandum of understanding with AID, dated February 1988, identifies a variety of assistance related to environmental issues that EPA is to provide AID. In addition, EPA is pursuing closer ties with bilateral donor agencies, the multilateral development banks (the World Bank and regional development banks), and the United Nations Development Program.

For rapidly industrializing developing nations, EPA's approach has been to provide more direct assistance, including consulting, training, and information-sharing, via formal agreements and informal arrangements between EPA and its foreign counterpart institutions. For example, part of a cooperative agreement with Mexico specifies that each country's laws and regulations will be enforced, to the extent possible, regarding transboundary shipments of hazardous wastes and substances, including pesticides. It also provides for notifying each other about regulatory actions to ban or severely restrict pesticides.

Under FIFRA's sections 17(a) and 17(b), EPA is to notify foreign governments when U.S. pesticide manufacturers export chemicals to their countries that are not registered for use in the United States and when EPA cancels or suspends a pesticide's use(s). When governments are alerted to unreasonable hazards associated with using particular pesticides, they can act to lessen exposure of their workers and citizens. The United States can benefit when a foreign government restricts using these harmful or potentially harmful pesticides on crops that are subsequently imported into the United States.

However, as discussed in chapter 2, we reported in April 1989 that EPA was not effectively monitoring compliance with FIFRA's export notification requirements, and we recommended several actions to improve the

effectiveness of EPA's program. At the same time, we reported that foreign governments rely on the United States for information on pesticides (1) that the United States has judged to be hazardous to human health or to the environment or (2) for which no hazard assessment has been made. We concluded that improvements in U.S. notification requirements could protect U.S. imported products when foreign governments receive full information on hazardous unregistered pesticides previously used on foods produced in their countries and intended for U.S. markets.

Food and Drug Administration

According to the Director of FDA's International Affairs Staff, FDA does not have a formal outreach program to assist foreign countries in meeting U.S. pesticide requirements. However, through the International Affairs Staff and often in cooperation and coordination with other agencies and organizations, FDA has provided technical training and consultation activities (including training programs funded through FAO, WHO, PAHO, or the training recipient's home country) to its foreign government counterparts on request. In addition, FDA has provided direct input to countries—through contact with the countries' embassies—on FDA detention of food from these countries. According to FDA's Americas' Desk Officer, such contacts have been made to identify and resolve problems causing detention and to reduce the countries' pesticide violations.

In a February 1988 report to the House Appropriations Committee, FDA stated that it uses the training activities and other contacts to stress the need for compliance with existing U.S. requirements and to encourage the countries to improve their pesticide regulatory controls. FDA also described cooperative activities to resolve pesticide residue problems. These activities ranged from agreements to investigate the source of a residue problem to, less frequently, the establishment of a formal memorandum of understanding between the appropriate foreign government entity and FDA.

Examples of FDA assistance activities follow:

- The International Affairs Staff, under the International Visitors Program, coordinates the scheduling of meetings with other agencies throughout the United States and the implementation of training. During fiscal year 1989, it coordinated such activities for over 600 foreign visitors from over 50 countries, including Mexico and Chile.

- FDA pesticide specialists have traveled to several countries, including Mexico and Chile, often under U.N. sponsorship, to train foreign pesticide analysts in analytical methods and to train administrative staff on the regulatory aspects of FDA's pesticide program.
- An FDA laboratory analyst has provided Costa Rica's Ministry of Health with assistance in (1) setting up government laboratories for assuring food safety and (2) getting government and industry to work together on food safety issues. This project is the result of the August 1985 Inter-American Conference on Food Protection, discussed in chapter 1, at which PAHO and FDA agreed to work together to implement projects that assist Latin American governments in upgrading their food protection systems.
- In 1986, at Chilean request, FDA presented information at Chilean seminars about U.S. pesticide laws and FDA policies and procedures regarding pesticides on imported food and the steps Chilean authorities should take to ensure that Chilean produce exports meet U.S. pesticide requirements.
- Mexico has requested more FDA laboratory training to assist it in applying 10 new regional laboratories to food safety testing, according to the Director, International Affairs Staff. FDA plans to provide the training at U.S. laboratories.
- In 1988 FDA offered to provide the Dominican Republic with whatever assistance was necessary to resolve extensive residue violations on imported produce. In early 1989, FDA officials met with officials of the Dominican Republic's government and export industry to discuss food products on countrywide automatic detention from the Dominican Republic because of pesticide residues. They also met to discuss initiatives the Dominican Republic's government was planning to remedy the situation.
- In 1989, according to the Director, International Affairs Staff, FDA assisted AID's regional office for Central America and Panama in assessing the extent of Guatemala's and Costa Rica's capabilities to perform laboratory testing on produce exports and identifying actions needed to improve such capabilities.

According to FDA's February 1988 report to the House Appropriations Committee, FDA has often been called on to provide input, guidance, and technical assistance to foreign government counterparts, foreign private sector organizations, and U.N. and other international organizations. FDA's interaction with FAO, WHO, the Codex Alimentarius Commission, and UNEP has ranged from document review to an active leadership role

in developing analytical guidelines or regulatory principles. For example, in its leadership role in a joint WHO/FAO/UNEP Global Monitoring System, FDA helped prepare a document that provides guidance, particularly for developing countries, on establishing monitoring programs to estimate the dietary intake of selected pesticides and chemical contaminants. In addition, FDA officials told us that FDA has worked with WHO to help set up an international program for chemical safety that serves as an information source for member governments.

Like EPA, FDA has cooperative agreements with Mexico. Cooperative agreements executed in 1988 with the Mexican Ministries of Health and Agriculture emphasize the exchange of information on pesticide regulations and detention and collaboration on mutual training projects. One agreement calls for (1) mutually developing programs of technical cooperation to strengthen Mexican food regulation and (2) discussing the harmonization of specifications for chemicals used in or on food.

U.S. Department of Agriculture

The Private Sector Relations Division of USDA's Office of International Cooperation and Development (OICD), as part of its implementation of CBI programs, assists countries in understanding U.S. import requirements. Agricultural programs under the CBI initiative are designed to promote economic development, two-way trade, and investment in the Caribbean Basin and Central America, and therefore emphasize marketing.

The division's principal means of outreach to CBI countries has been the workshops and seminars it has held in the region annually since 1983, which provide information on U.S. standards and regulations and basic marketing information needed by both U.S. and Caribbean Basin entrepreneurs. The Division has also developed the Agricultural Marketing Handbook for Caribbean Basin Products. The handbook provides information on most of the key U.S. regulatory agencies' activities and each agency's role over safety and quality of imported food. According to an OICD official, the Division's activities and personnel are funded primarily through AID; however, USDA funds an information center and provides the professional expertise.

Agency for International Development

AID tries to assist growers on pesticide use related to agricultural exports in a variety of ways. Through its Regional Office for Central America/Panama (ROCAP), it recently began to directly assist developing Central American countries in meeting U.S. pesticide requirements by disseminating regulatory information about pesticides legal in the United States

on nontraditional export crops from Central America. AID is also assessing the feasibility of using the Inter-Regional Research Project Number 4 (IR-4) Program,¹ which supports the development of pesticide tolerances for minor crops in the United States, to establish pesticide tolerances for Central American export crops that do not have U.S. pesticide tolerances.

In addition, by carrying out environmental assessments, before approval, of AID-assisted projects involving pesticides, AID has the opportunity to affect the safety of exported produce resulting from its agricultural export projects. These assessments, which are required by AID's environmental regulations, are to include, among other things, consideration of the EPA status of the proposed pesticides.²

Nontraditional Agricultural Export Support Project and Subproject

ROCAP has provided assistance to export growers and exporters in meeting U.S. pesticide requirements through extension of a regional project, Nontraditional Agricultural Export Support, which started in fiscal year 1986. The project's primary goal is to facilitate economic growth by expanding nontraditional agricultural exports, including fruits and vegetables, for Central America and Panama. The project provides assistance to export growers through key private sector exporter associations in several countries, including GREMIAL in Guatemala and CAAP in Costa Rica. Technical assistance and training is to be provided through these associations to the associations' members; local growers' associations; cooperatives; export brokers and sellers; and, to some extent, public sector export personnel. As discussed in chapter 3, exporter associations in some countries have played key roles in increasing export growers' abilities to meet U.S. pesticide requirements on exported crops, and the associations in the countries we visited were seeking information on U.S. pesticide requirements for their members.

In 1988 ROCAP began a subproject of the Nontraditional Agricultural Export Support project, under which it plans to (1) distribute regulatory

¹The IR-4 Program is a nationwide cooperative effort among USDA's Cooperative State Research Service and Agricultural Research Service; EPA; state agricultural experiment stations; and individual researchers, manufacturers, and growers. The national headquarters, at Rutgers University, New Brunswick, New Jersey, primarily assists in developing research protocols and, in cooperation with EPA and the manufacturer of the pesticide involved, in assembling petitions for pesticide registration.

²The conference report (H. Rept. 101-344) on the Foreign Operations, Export Financing, and Related Programs Appropriations Act, 1990 (P.L. 101-167, Nov. 21, 1989) requires AID to study and report by April 1, 1990, on the feasibility and potential benefits of joint research and education, including chemical, biological, and biotechnology research, on agricultural production in the Caribbean region (including the CBI nations and the U.S. states abutting the Gulf of Mexico).

information on U.S. import requirements to private and public sectors in Central America and (2) provide training to the nontraditional agricultural exporter associations on how to interpret basic references on U.S. regulatory information. This subproject responds to an urgent need of export growers in Guatemala, Costa Rica, and other Central American countries that have not had ready access to information on U.S. pesticide requirements for their export crops and risk rejection at U.S. entry points because of the information void. (See ch. 3.)

The subproject offers a direct opportunity for AID to assist export growers in determining which pesticides they will use and to ensure that they are applied correctly. According to a ROCAP document, ROCAP's long-term goal for the subproject is to have the exporter associations and public sector organizations, through the project training, be able to interpret the basic EPA references on pesticide regulations and begin to provide similar information and updates to export growers. In addition, ROCAP intends to build comparable reference files for Canadian and Codex (international) regulations regarding acceptable pesticide use and tolerances.

ROCAP accelerated the subproject's development as a result of our review, which revealed that exporters and export growers, many of whom were growing export crops under AID-assisted projects, lacked critical information about pesticides legal for use on produce destined for the United States. ROCAP's interest in accelerating the subproject also increased because of anticipated increases in FDA monitoring resulting from enactment of the Pesticide Monitoring Improvements Act of 1988. ROCAP documents stated concern that the potential for violative levels of pesticide residues may jeopardize the success of nontraditional crop exports—a cornerstone of AID's developmental strategy in Central America—and result in significant economic losses for Central American exporters and export growers.

Information

ROCAP intends to purchase, for the nontraditional agricultural exporter associations to give to growers and for governments, if appropriate, official U.S. government and commercial documents that provide information on pesticides with U.S. tolerances that can be used on nontraditional crops exported to the United States. ROCAP also intends to develop a pesticide label library for EPA-registered pesticides that are commonly used in Central America and maintains a complete file of USDA grade standards for all fresh produce products and some frozen products.

ROCAP has begun to prepare information bulletins, in Spanish and English, summarizing information from official U.S. government sources and trade publications on EPA-approved pesticides for use in growing and processing nontraditional export crops grown in Central America. The bulletins that have been prepared emphasize that all products registered with EPA are required by U.S. law to carry the label instructions; and they stress the need for "strict compliance" with EPA, FDA, and USDA regulations and for purchasing a pesticide product for use on a crop destined for export to the United States only if it has EPA-registered label instructions. One bulletin, dated November 2, 1988, and entitled "Pesticides Approved by the EPA for Use in Growing and Processing Pea Pods (Succulent Green Peas) Sno Peas, Snowpeas, Sugar-Snap Peas," includes the following information:³

- A list of the pesticides EPA has registered for use with pea pods in the United States, with the names and numbers under which the pesticides are registered and the trade names under which they are sold.
- EPA residue tolerance levels for products approved by EPA for use with pea pods, expressed in parts per million.
- A list of pesticides most commonly available in Central America for use on pea pods.

According to the ROCAP project manager, ROCAP had completed 10 of the planned 23 bulletins as of May 1989. He estimated that the 10 bulletins provide information on 80 to 90 percent of the nontraditional export crops destined for U.S. markets, including melons, asparagus, snow peas, raspberries, strawberries, okra, limes, squashes, and broccoli. An FDA report showed that it had invoked automatic detentions on several of these crops in 1988 for the countries we visited.

In addition to developing the information on EPA-approved pesticides, ROCAP intends to provide information on changes in U.S. regulations and/or inspection and administrative procedures. It also plans to provide Spanish translations of the legal portions of the USDA quality standards for fresh produce exported from Central America and Animal and Plant Health Inspection Service lists of admissible fruits and vegetables.

Training

ROCAP planned to provide training in pesticide use management, beginning in September 1989. AID environmental regulations (22 C.F.R. part 216) restrict the use of AID funds for procuring pesticides—specifically

³We did not verify the accuracy of the information ROCAP is developing in this project; however, according to the ROCAP project manager, AID coordinated with EPA in developing the information.

those EPA designates as "restricted use"⁴ pesticides on the basis of user hazards—until (1) users are made aware of the risks involved with these products and (2) technical assistance is provided, if necessary, to mitigate these risks.

ROCAP plans to base the formal training course, which would be provided by a private organization, on training programs used in the United States. This training would be given to private and public extension agents, agricultural chemical company representatives and salesmen, and pesticide manufacturer representatives who not only sell the products but also make technical recommendations on pesticide use. Ultimately, ROCAP intends to have the national governments certify the curriculum and examinations and issue licenses to recommend or sell pesticides.

The training element will cover general aspects of pesticide use; pesticide laws; pest biology and identification; pesticide classification and formulations; label comprehension; personal safety; pesticides and the environment; and issues related to specific aspects of pesticide use in Central America, including integrated pest management and pesticide cost calculations. ROCAP's plan is to train persons to train 300 to 400 others within their respective countries, with the training function ultimately becoming a function of the universities.

Assisting Developing Countries in Obtaining Pesticide Tolerances

In 1988 the Consortium for International Crop Protection (CICP)⁵ reported on a study it had prepared for AID on the feasibility of establishing a program to obtain U.S. tolerances for pesticides used on non-traditional export crops from Central America. As discussed in chapter 2, the lack of such tolerances affects some Central American and Caribbean exporters' ability to export produce to the United States, and no-tolerance violations at U.S. entry points can result in severe economic loss to exporters and growers.

⁴An EPA classification, determined during the registration process, that a pesticide, when applied in accordance with its directions for use, warnings, and cautions, or in accordance with a widespread and commonly recognized practice, and for uses for which it is registered, generally results in unreasonable adverse effects on the environment, including injury to the applicator.

⁵CICP is a nonprofit organization formed in 1978 by a group of U.S. universities and USDA for the principal purpose of assisting developing nations in reducing food crop losses caused by pests while also safeguarding the environment. CICP's basic goal is to advance economically efficient and environmentally sound crop protection practices in developing countries.

In its December 12, 1988, report, CICP said that an effort could be made to use the IR-4 Program, AID, or ROCAP as a petitioner for obtaining tolerances for pesticides used on nontraditional export crops that EPA has already approved for use on other commodities. Usually, the pesticide manufacturer is the petitioner. The IR-4 Program's principal function is to obtain tolerances for minor crops in which the manufacturer is not interested because the research and development costs are greater than the possible return to the manufacturer. However, according to an AID official, the IR-4 process is slow moving, has limited funding and staffing, and depends on release of information from the chemical companies.

The Consortium identified three pesticide/crop combinations that it said had the most urgent need to be considered under this proposal. They were methamidophos/snow peas, chlorothalonil/strawberries, and thiabendazole/chayote. As of the time we prepared this report, AID had not determined whether to implement CICP's proposal.

Assessment of Pesticide Use in Projects

According to AID regulations, proposed AID projects involving procurement and use of pesticides must generally receive an Initial Environmental Examination and, in some cases, an Environmental Assessment. Among the several matters to be assessed for each proposed pesticide are (1) its EPA registration status; (2) the requesting country's ability to regulate or control the pesticide's distribution, storage, use, and disposal; and (3) provisions made for monitoring the pesticide's use and effectiveness. Additional justification is required when the proposed pesticide has an EPA restricted use provision based on user hazard. In addition, if the project includes a pesticide against which EPA has initiated a regulatory action, the regulations require AID to discuss the technical and scientific details with the requesting government.

In implementing its regulations, AID can assist export growers in meeting U.S. requirements and affect the safety and quality of exported produce resulting from its projects. However, we noted or were told of several problems concerning the regulations. For example, not all AID-assisted projects are subject to AID's environmental regulations, and AID officials

and a 1988 report by the Committee on Health and Environment⁶ identified several problems affecting the regulations' implementation. Further, while the regulations require consideration of a pesticide's EPA status, they do not prohibit the use of pesticides that do not have an EPA tolerance established for use on the particular export crop in the United States.

Because our review was not directed at evaluating the effectiveness of the federal agencies' assistance efforts, we did not pursue these matters to the degree needed to fully establish their effect or to determine what steps AID has taken or is planning to improve implementation of its environmental regulations.

Observations

EPA, FDA, USDA, and AID have carried out a variety of activities to assist foreign countries in increasing their pesticide management capabilities. In particular, AID is currently providing Latin American and Caribbean export growers with information on what pesticides have U.S. tolerances for specific export crops, and EPA is providing guidance in developing pesticide monitoring for their exports. These efforts should prove useful in (1) decreasing the likelihood that U.S. consumers receive produce grown with pesticides lacking EPA tolerances for use on specific crops, (2) helping these countries avoid no-tolerance pesticide violations, and (3) preventing economic losses to exporters and U.S. importers.

⁶The Committee was formed by AID, with the Conservation Foundation, pursuant to section 539(i) of the Foreign Assistance and Related Programs Appropriations Act of 1987 (100 Stat. 3341-236). The Conservation Foundation is a nongovernmental environmental group that performs policy analyses of environmental issues. The Committee's report, Opportunities to Assist Developing Countries in the Proper Use of Agricultural and Industrial Chemicals, was issued Feb. 18, 1988.

Issues for Consideration by the Congress

As world trade has expanded, concerns have emerged about the safety and quality of imported food, and more attention has been given to recognizing and dealing with the different and complex food safety and quality standards among nations—particularly for pesticide residues on food. U.S. government and consumer concerns often focus on the increasing imports of produce from developing countries because the level of development of those countries' controls over food production has not always been perceived as providing sufficient assurance that exported produce will meet U.S. requirements and because U.S. import monitoring systems cannot provide a perfect safety/quality screen.

Much of the difficulty the five countries we visited had in considering U.S. pesticide requirements related to the absence of U.S. pesticide tolerances for certain export crops and incomplete information about what pesticides are acceptable for use on produce destined for the United States. The extent to which, and in what ways, U.S. agencies should increase their involvement in dealing with these matters are issues with implications for food safety, U.S. competitiveness, and U.S. agencies' responsibilities and resources.

Lack of Established Tolerances

Latin American and Caribbean countries' ability to meet U.S. pesticide requirements is exacerbated because the United States has few or no tolerances established for pesticides used on some crops grown in these countries—in some cases, because these crops are not grown commercially in significant quantities in the United States, and EPA may not have been petitioned to make a hazard assessment. When export growers are not aware of a specific country's requirements, they may use a pesticide that is not approved for use on a certain crop in the importing country, even though it may be allowed for use on another crop or on the same crop in their own country or another country. As discussed in chapter 2, produce destined for U.S. markets may consequently contain residues of pesticides that do not have EPA tolerances and be rejected at U.S. entry points, with economic loss to the exporting country, its growers, and the U.S. import industry.

To try to deal with this issue, AID is assessing the feasibility of using the IR-4 Program, which supports the development of pesticide tolerances for minor crops in the United States, to establish pesticide tolerances for Central American export crops that do not yet have U.S. pesticide tolerances. However, as discussed in chapter 4, an AID official told us that the IR-4 process is slow moving, has limited funding and staffing, and depends on release of information from the chemical companies.

Another effort to try to deal with this issue is the ongoing discussion among EPA, FDA, and USDA on whether to increase acceptance of Codex maximum residue limits (tolerances) on imported foods. At the time this report was prepared, EPA was considering a proposal that it recommend that, except in cases involving safety concerns, FDA and USDA accept Codex maximum residue limits for imported foods for which the United States does not have a tolerance. According to EPA, in its activities related to imported food, it seeks to ensure that food coming from other countries does not pose risks to the U.S. consumer while, at the same time, it also seeks to ensure that foreign agricultural growers and exporters do not have an unfair advantage over U.S. farmers.

The U.N. organizations—FAO, WHO, and Codex—have developed a multitude of international guidelines, including the Codex international pesticide residue standards, which many developing countries, in particular, depend on when developing their pesticide use and monitoring systems. The United States has been active in developing the Codex international guidelines and standards and, during the current Uruguay Round of the General Agreement on Tariffs and Trade, it has endorsed global harmonization of pesticide residue standards, through adopting international standards and codes of practice, as a way to eliminate nontariff trade barriers and facilitate world trade. However, where countries, such as the United States, have sophisticated food safety and quality systems in place, full adoption of the Codex international pesticide residue standards is complicated by the need to reconcile the international maximum residue limits with the countries' existing tolerances.

Deciding on the extent to which, and in what ways, U.S. agencies should increase their involvement in establishing tolerances for crops not grown commercially in significant quantities in the United States involves consideration of several matters. These matters include the degree to which establishing such tolerances will affect the safety of imported food; the effect on U.S. competitiveness, including the potential for increasing foreign growers' and exporters' ability to compete with the U.S. agricultural sector; the extent of the U.S. agencies' responsibility for taking the actions necessary to establish such tolerances; who should provide the financial and other resources necessary to develop the toxicological and other scientific data needed for establishing such tolerances; and whether the use of the IR-4 Program and the broader acceptance of Codex tolerances are appropriate ways of getting tolerances established for additional import crops.

Information

As agricultural exports expand and become more important to an individual country's economy, attention to the country's export markets' pesticide requirements heightens and systems evolve to obtain needed information for successful exports. We saw evidence of this evolutionary process in Chile and Mexico, which have been exporting produce to the United States for some time and which had established networks to obtain necessary information and technical assistance. This progress had occurred through cooperative efforts of these countries' governments and private sector exporter associations.

In the other countries, whose growers were less experienced in exporting fruits and vegetables, officials acknowledged the need to obtain more information. However, the necessary information networks had not been established.

While several U.S. agencies have provided pesticide-related training or technical assistance to foreign countries and have responded to requests for information, few agency resources have been devoted to providing information on specific pesticide/crop combinations allowed on imported food. Recently, however, greater communication with developing Central American countries about specific U.S. pesticide requirements by crop has occurred through AID's regional agricultural export support projects.

The extent to which, and in what ways, U.S. agencies should increase their involvement in providing information to U.S. trading partners is an issue that, like the establishment of additional tolerances, involves questions of increased food safety, U.S. agencies' authority and responsibility, U.S. competitiveness, and funding sources. For example, to what extent would providing information to foreign entities enhance the safety of imported foodstuffs? What degree of authority and responsibility do U.S. agencies have for providing information to foreign entities? To which foreign countries and entities should information be provided? Would increasing the flow of information enhance foreign growers' and exporters' ability to compete with the U.S. agricultural sector? And who should provide the financial and other resources needed to gather and disseminate the information?

The Challenge

Greater global standardization of pesticide tolerances among countries through greater acceptance of international standards could ultimately improve developing countries' abilities to export and could facilitate world trade. However, because adoption of international food safety and

quality standards is a slow, deliberative process, information exchange among countries, regarding specific pesticide/crop combinations, will need to continue to expand and improve to ensure that world trade is facilitated and that consumers are assured that food imports meet their countries' pesticide safety requirements.

The extent to which, and in what ways, U.S. agencies should increase their involvement in establishing import tolerances for additional crops and in increasing the flow of information on U.S. food safety and quality standards are issues that will confront the Congress as it deliberates on both food safety and U.S. competitiveness. Establishing tolerances for additional crops and increasing the flow of information could help increase U.S. consumers' assurance about the safety and quality of imported foods; help provide U.S. consumers with a larger variety of foods during a greater part of the year; and help developing countries, many of which are debtor nations, increase their exports to the United States. These actions could also, however, increase foreign growers' and exporters' ability to compete more directly with U.S. producers and processors and increase U.S. agencies' resource needs.

Pesticide Use Per Hectare, by Area or Nation

Area/nation	Pesticide use (grams per hectare) ^a	Rank
Japan	10,790	1
Europe	1,870	2
United States	1,490	3
Latin America	220	4
Oceania ^b	198	5
Africa	127	6

^aOne gram equals about .035 ounce.

^bIncludes Australia, New Zealand, and various Pacific Ocean islands.

Source: Bengt V. Hofsten and George Ekstrom, editors, Control of Pesticide Applications and Residues in Food: A Guide and Directory—1986 (Uppsala, Sweden: Swedish Science Press).

U.S. Produce Imports by Region, 1988

Region/country	Volume (metric tons)		Percent of total imports	
	Country	Region	Country	Region
Latin America and Caribbean		5,541,708		77
Mexico ^a	1,795,540		25	
Ecuador	797,595		11	
Costa Rica ^a	676,269		9	
Honduras	669,682		9	
Colombia	514,953		7	
Chile ^a	421,709		6	
Guatemala ^a	261,789		4	
Panama	185,752		3	
Dominican Republic ^a	89,914		1	
Brazil	42,246		1	
Argentina	25,759		b	
Bahamas	13,546		b	
Venezuela	11,741		b	
Jamaica	11,459		b	
El Salvador	10,193		b	
Other	13,561		b	
Asia/Middle East		618,725		9
North America (primarily Canada)		556,954		8
Western Europe		387,256		5
Oceania		56,177		1
Eastern Europe		28,022		b
Africa		4,571		b
Union of Soviet Socialist Republics		203		b
Total		7,193,616		100

Note: Data include fruits, vegetables, bananas, and plantains.

^aChile, Costa Rica, the Dominican Republic, Guatemala, and Mexico accounted for 3,245,221 metric tons, or 59 percent of U.S. produce imports from the Latin American and Caribbean countries in 1988.

^bLess than 1 percent.

Source: Foreign Agricultural Trade of the United States, Calendar Year 1988 Supplement, Economic Research Service, USDA.

Federal Agencies Involved in the U.S. Safety and Quality Network for Imported Produce

The U.S. safety and quality network for imported produce involves several federal agencies. The primary ones are EPA, FDA, and USDA. These agencies' safety and quality activities, primarily as they relate to imported produce, are discussed below.

Environmental Protection Agency

EPA is authorized to register pesticides and establish pesticide residue tolerances that all fresh produce and other foods and feeds must meet to be considered safe for the U.S. market.

EPA Establishes Residue Standards

Under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended (7 U.S.C. 136 *et seq.*), EPA is authorized to register and reregister pesticide products, specify the terms and conditions of use, and remove unreasonably hazardous pesticides from the marketplace.¹ In addition, the Federal Food, Drug, and Cosmetic Act (FFDCA), as amended (21 U.S.C. 301 *et seq.*), authorizes EPA to establish (1) tolerances under section 408(d) for pesticides undergoing registration under FIFRA and (2) import tolerances under section 408(e) for pesticides where there is no registration request under FIFRA and the commodity is being treated outside the United States. EPA can also grant exemptions to use unregistered pesticides when it determines a tolerance is not necessary to protect the public health.

If a pesticide is to be used on food or feed commodities or if its use will lead to residues on these products, FFDCA requires EPA to establish the legal maximum acceptable level of each pesticide residue—tolerance level—allowed on each specific food and animal feed, or a tolerance exemption, for both domestic and imported foods. These tolerance levels are set on the basis of data submitted by the petitioner (usually a chemical manufacturer) who is requesting the residue tolerance. The tolerance data include information on the pesticide's toxicity (potential to cause adverse health effects) and residues (amount which may remain in or on food). Tolerances cannot be legally exceeded and no residue of a pesticide is permitted in or on foods for which an EPA tolerance or exemption has not been established.

¹Under the 1972 FIFRA amendments, the Congress mandated that EPA assess the safety of all pesticides that had been previously registered by federal and state governments. We reported in 1986 (GAO/RCED-87-7, Oct. 27, 1986) that EPA had not yet completed a final reassessment on any pesticide active ingredient. Through the 1988 FIFRA amendments, the Congress gave EPA additional funding for conducting these assessments for the approximately 45,000 products that have not been assessed at current standards, and about 9 years for completing the task.

The registration data, which are required for each pesticide use when applying for domestic pesticide registration, include product chemistry, residue chemistry, environmental fate, and toxicology data. According to EPA officials, a pesticide registration for use on a food crop must be accompanied by the establishment of a tolerance or an exemption from the requirement of a tolerance. Most of the data used in making a tolerance decision are also considered in deciding whether to register a pesticide product.

FIFRA also includes export notification provisions for pesticides intended solely for export. Section 17(a) requires that before an unregistered pesticide is exported, the foreign purchaser has signed a statement acknowledging an awareness that the pesticide is not registered and cannot be sold for use in the United States. EPA requires that the exporter/manufacturer transmit the foreign purchaser acknowledgment to EPA and certify to EPA that the shipment did not occur before receiving the foreign purchaser statement. EPA sends copies of these statements to U.S. embassies in the importing countries, which then forward the statements to the appropriate government official in the importing country. EPA requires these statements for the first shipment of each unregistered product to a particular purchaser for each importing country, annually.

Section 17(b) requires EPA to notify foreign governments and appropriate international agencies regarding its actions to cancel or suspend a pesticide's U.S. registration. The notifications under section 17(b) benefit both the United States and the foreign governments. Foreign governments benefit because they are alerted to unreasonable hazards associated with using particular pesticides and can act to lessen exposure of their workers and citizens. The United States can benefit when a foreign government restricts using these harmful and potentially harmful pesticides on crops that are subsequently imported into the United States. As discussed in chapter 2, we reported in April 1989 that EPA did not have an effective program to determine whether these notification requirements were being met, and we made several recommendations to EPA to improve its notification program.²

EPA Establishes Import Tolerances

Pesticides used in foreign countries are not required to be registered with EPA. However, foreign uses of pesticides that do not have an EPA tolerance or an exemption can result in a commodity's rejection at the

²Pesticides: Export of Unregistered Pesticides Is Not Adequately Monitored by EPA (GAO/RCED-89-128, Apr. 25, 1989).

U.S. entry point as a no-tolerance violation if residues are detected. EPA is authorized under FFDCA's section 408(e) to establish tolerances—sometimes called import tolerances—on its own initiative, or at the request of interested parties, when petitioners are not seeking tolerances under section 408(d) as a part of obtaining a U.S. registration under FIFRA. Pesticides used to produce food in the United States, however, must have both U.S. registrations and tolerances—if not exempted—for the pesticides' use. According to EPA's Chief, Policy and Special Projects Staff, Office of Pesticide Programs, import tolerances for pesticides that do not have U.S. registrations may be necessary because foreign countries (1) grow crops that are not grown in the United States and (2) have different pest and disease problems because of different climates.

To obtain an import tolerance under section 408(e), a petitioner must submit some of the same types of data required for petitions submitted under section 408(d)—product chemistry, residue chemistry, and toxicological data for pesticide use on each specific crop for which a tolerance is requested. Environmental fate data are not required for establishing import tolerances because the pesticides are applied in foreign countries and do not affect the environment of the United States. When pesticides are already registered in the United States, EPA may require only residue chemistry data for each new foreign crop use. In addition, the petitioner must discuss any controls regulating pesticides in the host country in which the pesticide will be used and provide some evidence that requirements for use in the host country have been met.

EPA does not maintain data that readily show the number of existing import tolerances established under FFDCA's section 408(e) provisions. However, the Office of Pesticide Programs was able to identify several pesticides and tolerances that have been established or kept primarily for import purposes. According to the Chief of the Office of Pesticide Programs' Policy and Special Projects Staff, import tolerance petitions represent a small percentage of all tolerances approved by EPA. As of December 1988, 52 petitions were in active status. Of these, 47 had been reviewed and returned to the petitioner due to data deficiencies, and 5 were under review by EPA.

Food and Drug Administration

FDA is responsible for enforcing EPA's pesticide residue tolerances for all food products—both domestic and imported—except meat, poultry, and eggs, which are monitored for pesticide residues by USDA. FDA also samples food offered for import for other adulterating conditions, such as microbial and filth contamination, foreign objects, and decomposition.

FDA Enforces EPA Pesticide Standards

Under FFDCA, FDA is responsible for protecting the U.S. public from unsafe foods and other products. FDA is authorized to examine samples of foods being offered for import into the United States. A food shipment is considered adulterated if it contains, among other things, either (1) a pesticide residue that is not subject to an EPA-approved tolerance for that food or (2) a pesticide residue in an amount greater than the EPA tolerance level. In monitoring the entry of imported foods and removing adulterated products from the marketplace, FDA works in cooperation with the U.S. Customs Service, Department of the Treasury. Customs is responsible for (1) notifying FDA of all formal entries subject to FDA jurisdiction, (2) requiring importers to post a bond on imported food distributed to owners or consignees pending FDA approval for release into U.S. commerce, (3) ordering and supervising the export or destruction of foods FDA identifies as adulterated, and (4) imposing and collecting liquidated damages against importers who fail to export or destroy adulterated shipments.³

FDA's Import Monitoring Program

Of FDA's 21 district offices, 20 selectively sample imported foods on the basis of various data and historical information on imports.⁴ Our 1986 report on monitoring and enforcement activities for pesticide residues in imported foods recommended, among other things, that (1) FDA increase its sampling coverage of imported food to a wider range of imported foods and countries and (2) consider several options for obtaining additional information on pesticides actually used in foreign food production. As a result, FDA has expanded its guidance to field offices on criteria and additional data to be used in determining what countries and commodities to sample.⁵

In addition, according to its program documents, FDA performs (1) headquarters-initiated sampling to help ensure adequate national coverage of pesticides and (2) special emphasis surveys in each district on import sampling for country/commodity combinations not covered by a district's past monitoring. The district offices also conduct special surveys

³We discussed the adequacy of FDA's and Custom's monitoring and enforcement activities in Pesticides: Better Sampling and Enforcement Needed on Imported Food (GAO/RCED-86-219, Sept. 26, 1986).

⁴FDA's Newark District Office does not have any responsibility for import inspections.

⁵According to FDA, it uses data purchased from the commercially produced Battelle World Agrochemical Databank to obtain information on what pesticides are being used on different crops in countries and regions of the world. According to FDA, the databank provides information on pesticides used on selected crops in about 25 to 30 countries that generally represent the pest and climate conditions in various regions of the world.

when information on foreign pesticide use indicates the use of pesticides that are not allowed for use on food in the United States. A new planning process, initiated in fiscal year 1988, was designed to require the district offices to document their annual pesticide sampling decisions for imported foods. FDA officials told us, however, that they expect it will take several years to fully achieve satisfactory district sampling plans and follow-up.

FDA Enforcement

FDA can request Customs to detain imported food that FDA suspects, either from past experience or initial sampling results, contains illegal pesticide residues. According to FDA's Regulatory Procedures Manual, when FDA suspects that a product may be violative given its past violative history and/or other information, it can invoke automatic detention, which requires that, until the automatic detention is removed, the importer provide certification from a private laboratory that shows each subsequent shipment is free of violative levels of the pesticide in question. According to FDA, it reviews the certifications to ensure their adequacy. For fresh produce, automatic detention remains in effect for all subsequent lots of the same produce for the rest of the growing season unless the grower/shipper demonstrates that the residue problem no longer exists or that the produce to be shipped originated in fields that were not treated with the pesticide in question.

FDA program documents indicated that, as of April 1988, FDA districts could recommend placing shippers under automatic detention after one violation; under prior practice, FDA did not recommend automatic detention with laboratory certification requirements for future shipments until two violations had occurred. Program documents also state that when illegal pesticide residues are found to be widespread on a particular commodity within a country, FDA can require certification from all shippers of that commodity in the country.

U.S. Department of Agriculture

Two USDA agencies, the Agricultural Marketing Service (AMS) and the Animal and Plant Health Inspection Service (APHIS), carry out inspections of imported produce.

AMS Inspects for Compliance With Quality Standards

AMS assesses the quality of some imported produce through mandatory and voluntary quality inspections that are paid for by the importer. Section 8e of the Agricultural Marketing Agreement Act of 1937, as amended (7 U.S.C. 608e-1), mandates that certain imported commodities

meet minimum quality requirements during the effective dates of the applicable federal marketing orders. As of March 1988 the imported commodities covered by section 8e were avocados, dates (except dates for processing), filberts, grapefruit, table grapes, limes, olives (except Spanish-style onions), onions, oranges, Irish potatoes, prunes, raisins, tomatoes, and walnuts.⁶ Section 8e requirements help keep inferior grades of a commodity from depressing the market for an entire crop. Because weather significantly influences crop production, requirements may change from season to season, as supply and demand change. According to an AMS official, when imported fresh produce does not pass mandatory inspections for quality, AMS permits the importer to (1) recondition the produce, (2) reship the produce, or (3) destroy the shipment.

Voluntary inspections are authorized by the Agricultural Marketing Act of 1946 (7 U.S.C. 1621 et seq.). These quality inspections evaluate the imported produce usually according to USDA's grade standards and/or other contract specifications. Importers and others use quality inspections (1) as a basis for determining the value of fresh produce in price determinations; (2) as evidence of compliance with contract specifications; (3) to enable appropriate labeling to be printed; and (4) in general, to facilitate the trade in fresh produce in both domestic and international markets. According to an AMS official, even when the mandatory import inspections do not apply, importers usually still want to have voluntary inspections to determine the quality of their product. AMS performs mandatory import inspections at the Customs control points at U.S. entry points. Voluntary inspections are conducted by AMS, either by itself or in cooperation with the states.

APHIS Conducts Inspection and Quarantine Activities

APHIS is not directly involved in ensuring the safety or quality of imported fruits and vegetables. However, it conducts inspection and quarantine activities at U.S. entry points (and inspection, survey, and control activities at some foreign locations) to identify and prevent the introduction of exotic animal and plant diseases and pests that might threaten U.S. agriculture. APHIS develops and conducts preclearance programs, which include such activities as inspecting the products and determining what type of treatment is necessary to make the product pest-free for the United States.

⁶Legislation before the 101st Congress (H.R. 2026, H.R. 3567, and S. 1729) would add such commodities as kiwi fruit, nectarines, papayas, and plums to the list of imported commodities subject to mandatory inspection.

International Organizations' Roles in Developing Food Safety Systems

Several international organizations play important roles in assisting developing countries to develop their food safety control systems. These organizations, whose activities are discussed below, include the U.N. Food and Agriculture Organization (FAO), U.N. World Health Organization (WHO), Codex Alimentarius Commission, Pan American Health Organization (PAHO), and Inter-American Institute for Cooperation on Agriculture (IICA).

U.N. Food and Agriculture Organization

FAO adopted an International Code of Conduct on the Distribution and Use of Pesticides in 1985, and it has published guidelines to assist governments and industries in implementing the code. The FAO code and guidelines provide a framework for developing or improving pesticide control laws and regulations. As of January 1990, all of FAO's 158 member countries, including the United States, had endorsed the FAO code of conduct. A January 1989 FAO survey of governments on implementation of the code of conduct showed that many developing countries, including Latin American and Caribbean countries, were observing the code to varying degrees. However, the survey report also stated that developing countries reported that they generally have problems with the quality of pesticide formulations, packaging, and receiving technical assistance.

U.N. World Health Organization

WHO has developed a pesticide hazard classification system that classifies pesticides into one of four hazard levels. The hazard level is determined according to the acute risk to health by single or multiple exposures to the pesticide over a short period of time. The system forms the basis of a harmonized pesticide labeling format recently adopted by many Central and South American countries. (See ch. 2.)

Codex Alimentarius Commission

Codex, a subsidiary body of FAO and WHO, was established in 1963 to set international food standards to protect the health of consumers and to facilitate international trade in food through these harmonized standards. Codex has published international standards for the hygienic and nutritional quality of food; food additives; pesticide residues, including maximum residue limits (tolerance levels); contaminants; labeling and presentation; and methods of analysis and sampling. Member governments are encouraged to accept and incorporate the food standards and guidelines, which are developed by Codex working committees, into national legislation and regulations.

Developing countries that lack the research capabilities to independently develop food standards are able to adopt Codex international standards for domestic and exported foods. However, according to a Codex document, full acceptance of Codex standards is a slow process because governments must reconcile the continuing development of Codex standards with their changing national food laws, which reflect each country's own domestic health issues, environment, and consumer and industry concerns. The United States accepts Codex standards when the Codex tolerance is the same as the EPA tolerance for that pesticide/commodity combination. In some cases, EPA will revise its tolerance to match the Codex tolerance, such as when EPA has determined that the Codex tolerance is similar to the EPA tolerance and it does not compromise the U.S. consumers' safety.

FDA and USDA's Food Safety and Inspection Service have supported a proposal that EPA recommend that FDA and the Service use Codex standards for imported foods for which EPA does not have a tolerance. The proposed regulation states that this acceptance would not apply in cases where (1) EPA has canceled or suspended pesticides, (2) EPA has new toxicological information of concern, or (3) EPA questions the safety of dietary exposure to residues of the pesticide. EPA had not taken a position on the proposal at the time of this review.

Codex's Committee on Pesticide Residues has formed an ad hoc working group for pesticide residue problems in developing countries. The working group considers such matters as implementing the FAO International Code of Conduct on the Distribution and Use of Pesticides in developing countries, pesticide training activities, and the need for better pesticide residue data as a means of helping developing countries move towards better national pesticide control systems.

Pan American Health Organization

PAHO is a member of the U.N. system of international agencies and, by agreement, an advisor to the Organization of American States regarding health-related matters. PAHO's membership includes countries in North, Central, and South America and in the Caribbean. Its objective is to generally promote and coordinate the efforts of these countries in combating disease, prolonging life, and promoting the physical and mental health of its peoples.

PAHO works cooperatively with other organizations in providing broad assistance to Latin American and Caribbean countries, including participation in regional conferences, training, mobilizing resources, and providing technical assistance. For example, as a result of the August 1985 Inter-American Conference on Food Protection, PAHO and FAO developed a 5-year regional program to strengthen the food safety and quality control programs in Latin American and Caribbean countries. PAHO is also working with FDA to develop a model of technical cooperation for developing food safety systems in Latin America and the Caribbean. The agencies chose Costa Rica in Central America and Jamaica in the Caribbean as countries on which to base the models.

Inter-American Institute for Cooperation on Agriculture

IICA was founded in 1942 as an institution for agricultural research and graduate training in tropical agriculture. It gradually evolved into an intergovernmental technical organization designed to encourage, promote, and support the efforts of its 31 member nations to achieve agricultural development and rural well-being. IICA focuses its resources and technical capacity on modernizing agricultural technology and strengthening regional integration.

IICA helped to develop harmonized pesticide labeling and registration regulations, based on FAO/WHO guidelines, for Latin American countries. Beginning in 1981, it supported a series of regional meetings between government and agrochemical industry representatives to develop harmonized pesticide regulations. IICA encouraged ministries of agriculture in member countries to implement the standardized labeling and registration regulations. As of June 1988 many Central and South American countries had adopted a standard label format for pesticides sold in their countries.

Status in Five Countries of Pesticides That Do Not Have EPA Tolerances Established for the Active Ingredients

Pesticide	Chile	Costa Rica	Dominican Republic	Guatemala	Mexico
Alachlor ^a + Nudolin	NR	NR	R	NR	NR
Aldrin ^b	R ^c	NR	NR	NR	NR
Amitrole	NR	NR	R	NR	NR
Azamethiphos	NR	NR	NR	NR	R
Azinphos-ethyl	R	NR	R	NR	NR
Azocyclotin ^d	R	NR	NR	NR	NR
BHC (benzene hexachloride) ^e	NR	NR	NR	NR	R
Bioallethrin	NR	R	NR	NR	NR
Bitertanol ^d	R	NR	NR	NR	R
Blasticidin-S	NR	R	R	NR	NR
BPMC (Fenobucarb)	NR	R	NR	NR	NR
Brodifacoum	NR	R	NR	R	R
Bromadiolone	NR	NR	NR	NR	R
Bupirimate	R	NR	NR	NR	NR
Buprofezin	NR	NR	NR	R	NR
Buthidazole	NR	NR	R	R	NR
Butocarboxim	NR	NR	NR	R	NR
Caldo Bordeles + Cufraneb	NR	NR	R	NR	NR
Captan ^f + Metoxiclolo	NR	NR	R	NR	NR
Carbaxim + Captan ^f	NR	NR	R	NR	NR
Cartap ^d	NR	R	NR	NR	NR
Chlordane ^g	NR	R	R	R ^c	R
Chlordane ^g + Pentac	NR	R	NR	NR	NR
Chlorophacinone	NR	R	R	NR	NR
Chlorotoluron	NR	NR	NR	NR	R
Ciometrinilo	NR	R	NR	NR	NR
Citrolina	NR	NR	NR	NR	R
Colecalciferol	NR	NR	NR	NR	R
Coumachlor	NR	NR	NR	NR	R
Coumachlor + Sulfamidamide	NR	NR	R	NR	NR
Coumatetralyl	NR	R	R	R	R
Cyflorilate	NR	NR	R	NR	NR
Cymoxanil + Mancozeb ^f	NR	NR	R	NR	NR
DBCP (dibromochloropropane)	NR	NR	R ^c	R ^c	NR
Demeton-(O or S)-methyl	R	R	R	R	R
Dichlofluanid ^d	R	R	NR	R	NR
Dieldrin ^b	NR	NR	R ^c	NR	NR

(continued)

**Appendix V
Status in Five Countries of Pesticides That
Do Not Have EPA Tolerances Established for
the Active Ingredients**

Pesticide	Chile	Costa Rica	Dominican Republic	Guatemala	Mexico
Dienochlor	R	R	R	R	R
Dietanolamina	NR	R	NR	NR	NR
Difenacoum	NR	NR	R	NR	NR
Dimethirimol	NR	NR	R	NR	NR
Dimethylamine	NR	R	NR	R	NR
Dimethyl urea	NR	NR	R	R	NR
Dinobuton	NR	NR	R	NR	NR
Diocil Sulfosun.	NR	R	NR	NR	NR
Diphacinone	NR	NR	R	R	R
Dodemorph	NR	R	R	R	R
Edifenphos ^d	NR	R	R	R	R
Epibloc	NR	NR	NR	R	NR
Ethidimuron	NR	NR	NR	NR	R
Ethiofencarb ^d	R	NR	NR	NR	NR
Fenaminosulf	R	R	NR	R	NR
Fentin acetate	R	R	R	R	R
Flamprop-methyl	NR	NR	NR	NR	R
Flocoumafen	NR	NR	NR	R	NR
Flubenzimine	R	NR	NR	NR	NR
Flumetrina	NR	NR	NR	NR	R
Fluorodifen	NR	NR	R	NR	NR
Fluosilicato	NR	NR	R	NR	NR
Flutriafol	R	NR	NR	NR	NR
Fonofos	NR	NR	R	NR	NR
Glufosinate	NR	NR	NR	NR	R
Guazatine ^d	NR	NR	R	NR	NR
Hexaconazole	NR	NR	NR	R	NR
IBP (Iprobenfos)	NR	R	NR	NR	NR
Ioxynil + 2,4-D ⁱ	NR	R	NR	NR	NR
Ioxynil octanoate	NR	NR	R	NR	NR
Isazofos	NR	R	R	R	NR
Isoforona	NR	R	NR	NR	NR
Isoproturon	NR	R	NR	NR	R
Kasugamycin	R	R	R	R	R
MAFA	NR	R	NR	R	NR
MCCEP	NR	NR	R	NR	NR
Mephosfolan	NR	R	R	R	NR
Metaldehyde ^h + Tri. Arsenate	NR	NR	R	NR	NR
Methabenzthiazuron + Amitrole	NR	R	NR	NR	NR
Metham-sodium	NR	NR	R	R	R

(continued)

**Appendix V
Status in Five Countries of Pesticides That
Do Not Have EPA Tolerances Established for
the Active Ingredients**

Pesticide	Chile	Costa Rica	Dominican Republic	Guatemala	Mexico
Methyl isothiocyanate	NR	NR	NR	NR	R
Mirex	NR	NR	NR	R	NR
Naptalam	NR	NR	R	NR	NR
Nitrofen (DCP)	NR	NR	R	NR	NR
Ofurace	NR	R	NR	NR	NR
Omethoate ^d	R	NR	NR	NR	R
Oxycarboxin	NR	R	R	R	R
Penconazole	NR	NR	NR	R	NR
Penconazole + Mancozeb ⁱ	R	NR	NR	NR	NR
Pentachlorophenol	NR	NR	NR	R	R
Phenothiol	NR	R	NR	NR	NR
Phenothrin ⁱ	NR	R	NR	NR	NR
Phenthoate ^d	R	NR	R	R	R
Phoxim ^d	R	R	R	R	R
Piperophos + Dimethametryn	NR	R	R	R	NR
Pirimicarb ^d	R	R	NR	R	R
Pirimidil	NR	NR	R	NR	NR
Propamocarb ^d	NR	NR	R	R	NR
Prothiofos	R	R	NR	R	NR
Prothoate	NR	NR	R	NR	NR
Pyracarbolid	NR	NR	NR	R	NR
Pyrazophos	R	R	R	NR	R
Quinalphos	R	NR	NR	NR	NR
Sal Sodio Disp	NR	R	NR	NR	NR
Sal Sodio Naft.	NR	R	NR	NR	NR
Tetracloruro de Carbono + Acrylo	NR	NR	R	NR	NR
Tetramethrin	NR	R	NR	NR	R
Thiometon ^d	R	NR	NR	NR	NR
Tiocabazil	NR	NR	R	NR	NR
Tolclcfos-methyl	NR	R	NR	NR	NR

(continued)

Appendix V
Status in Five Countries of Pesticides That
Do Not Have EPA Tolerances Established for
the Active Ingredients

Pesticide	Chile	Costa Rica	Dominican Republic	Guatemala	Mexico
Triazophos ⁱ	NR	NR	R	R	R
Triflumuron	R	NR	NR	NR	R
Xiligen	NR	R	NR	NR	NR

Legend

NR = Not registered for use

R = Registered for use

^aEPA has tolerances for this chemical, but not for combination shown.

^bEPA has action levels and Codex has maximum residue limits (MRLs) for this chemical.

^cThis pesticide is on the country's registration list but has been officially prohibited.

^dCodex has MRLs for this chemical.

^eEPA has action levels for this chemical.

^fEPA has tolerances and Codex has MRLs for this chemical.

^gEPA has action levels and Codex has extraneous residue limits for this chemical.

^h40 C.F.R. 185.4025 allows preharvest use of this chemical on strawberries, but sets a zero tolerance for residues.

ⁱCodex has temporary MRLs for this chemical.

Source: Government pesticide registration lists for Chile, Costa Rica, the Dominican Republic, Guatemala, and Mexico for 1987 or 1988. (See ch. 1, fn. 13.) EPA verified in 1989 that, according to its records, the pesticides (except as shown in the footnotes) do not have tolerances established for any food use in the United States. Where possible, English spellings and other information on chemicals were obtained from the Code of Federal Regulations, title 40 parts 180 and 185 (revised as of July 1, 1989); Farm Chemicals Handbook (Willoughby, Ohio: Meister Publishing Co.), 1987; Glossary of Pesticide Chemicals, FDA, Sept. 1988; Guide to Codex Maximum Limits for Pesticide Residues, Part 2, CAC/PR 2 - 1988, Apr. 1988, issued by The Netherlands; The Pesticide Chemical News Guide, Reo, P.D., and M.B. Duggan, eds. (Washington, D.C.: Louis Rothschild, Jr.), June 1, 1988; and The Pesticide Manual, A World Compendium, 8th ed., C.R. Worthing, ed. (Thorton Heath: The British Crop Protection Council), 1987.

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